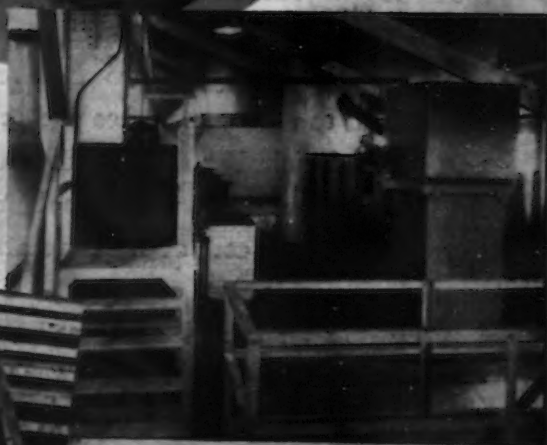


APRIL 7, 1938

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THE IRON AGE

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2—THE IRON AGE, April 7, 1938

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# ▲▲▲ THE IRON AGE ▲▲▲

APRIL 7, 1938

ESTABLISHED 1855

Vol. 141, No. 14

## Industry Works for Its Workers

CONSIDERING the fragile material of which it is made, the soap box has supported a lot of people. Quite a number of vociferous demagogues, political and otherwise, still make a remunerative living by standing upon it. It has been particularly profitable during the past few years.

A man on a soap box can always collect a crowd, no matter what sort of crackpot philosophy, religion, health doctrine or politics he is handing out. And he always finds plenty of takers for his wares. In this respect the same advantage is taken of human gullibility as was taken by the old-school itinerant quack who toured the country selling colored water guaranteed to cure all of the ills of man or beast.

The quack medicine man "got away with it" partly because he put on a good show and partly because there was no authority at hand with dependable facts with which to contradict his wild claims. If some dependable doctor, esteemed in the community, had been present to tell the audience that the quack's concoction was valueless or perhaps even harmful—and prove it—doubtless the sales would have dwindled considerably.

In the article which follows this page, L. A. Young kicks the soap box from under the demagogue who has been selling the poisonous nostrum of class hatred to American workers. These nosey, noisome, and noisy parasites on the body politic have been preaching in high places and low that the employee is being increasingly ground beneath the heel of a rapacious and hard hearted monster known as the employer. They have had plenty of takers, largely because the facts to disprove their assertions were not forthcoming.

Mr. Young controverts these assertions through the unimpeachable authority of a Government survey conducted by the Department of Commerce under the auspices of the present Administration and published through the Government Printing Office in 1936. Under the circumstances this cannot be dismissed as propaganda by the employing class, the Republican party or the Liberty League.

We urge all of our readers to carefully study the facts which Mr. Young presents and to broadcast them as widely as possible in the interest of a more united front by employees and employers in the coming march of progress.

*J. H. Van Derveer*



# Kicking the Soap Box From Under

**I**N every section of this country, whether in Savannah or Seattle, Dallas or Detroit—the same question is continuously asked, and as a general rule goes completely unanswered. We hear this question in every farmhouse, in every working man's home, in the home of every consumer, and that takes in most of us, a question that must be answered if democracy is to stand, if liberty is

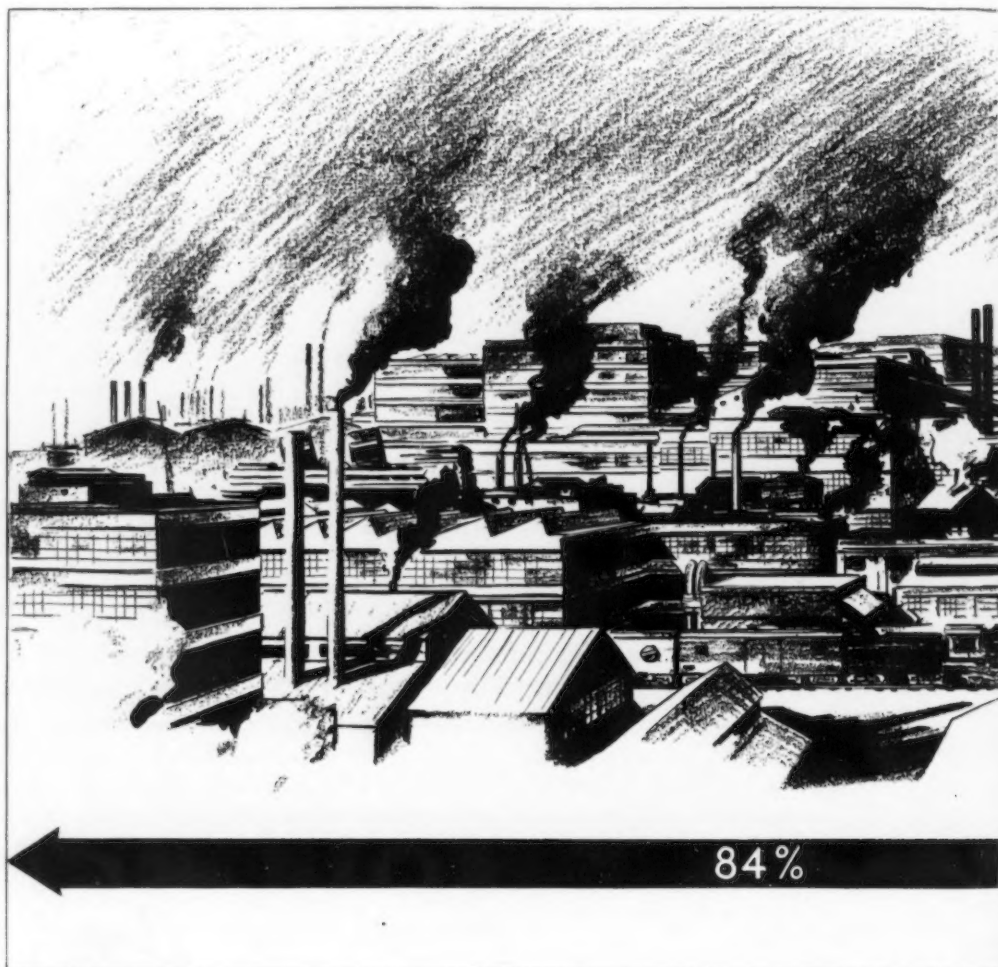
"National Income in the United States, 1929-1935." Published by U. S. Department of Commerce. Obtainable from U. S. Government Printing Office, Washington, D. C. Price 25c.

to remain, and peaceful progress be insured. Is the charge true that has been hurled from a thousand platforms weekly throughout the United States—or is it untrue—"that the employees and the average people of the country get practically nothing, and the employers, the bankers, the bondholders and stockholders get practically all of our national income?" We might as well face facts, for sooner or later we will have to face them anyway. These charges have been made, they have been published and republished in literally millions of pamphlets, book-

lets and newspapers. They have been shouted by thousands of soap box orators. They have been hurled upon legislative bodies by inflamed politicians, and yet the astonishing fact is that there have been very few attempts made to answer those devastating charges.

Let's follow this line of reasoning a little further. *If the condition actually does exist that the demagogues and radicals say and think exists, we live under an intolerable economic system—the radicals are the patriots, and the so-called sound thinking people*

• • •  
**E**IGHTY - FOUR per cent of our entire American manufacturing industry, buildings, equipment and land is being operated for the sole benefit of the employees who work therein.  
• • •



**E**NLARGED copies of the above illustration, with short explanatory request by our Reader

# the Demagogue

By L. A. YOUNG

President, L. A. Young Spring & Wire Corp.

of this country are the men who are dead wrong. If the economic conditions that the demagogues and the extreme radicals say exist do not exist, the business leaders, the civic leaders, the leaders of all organized groups in every community should step out and definitely and vigorously not only deny the charge, but establish the truth.

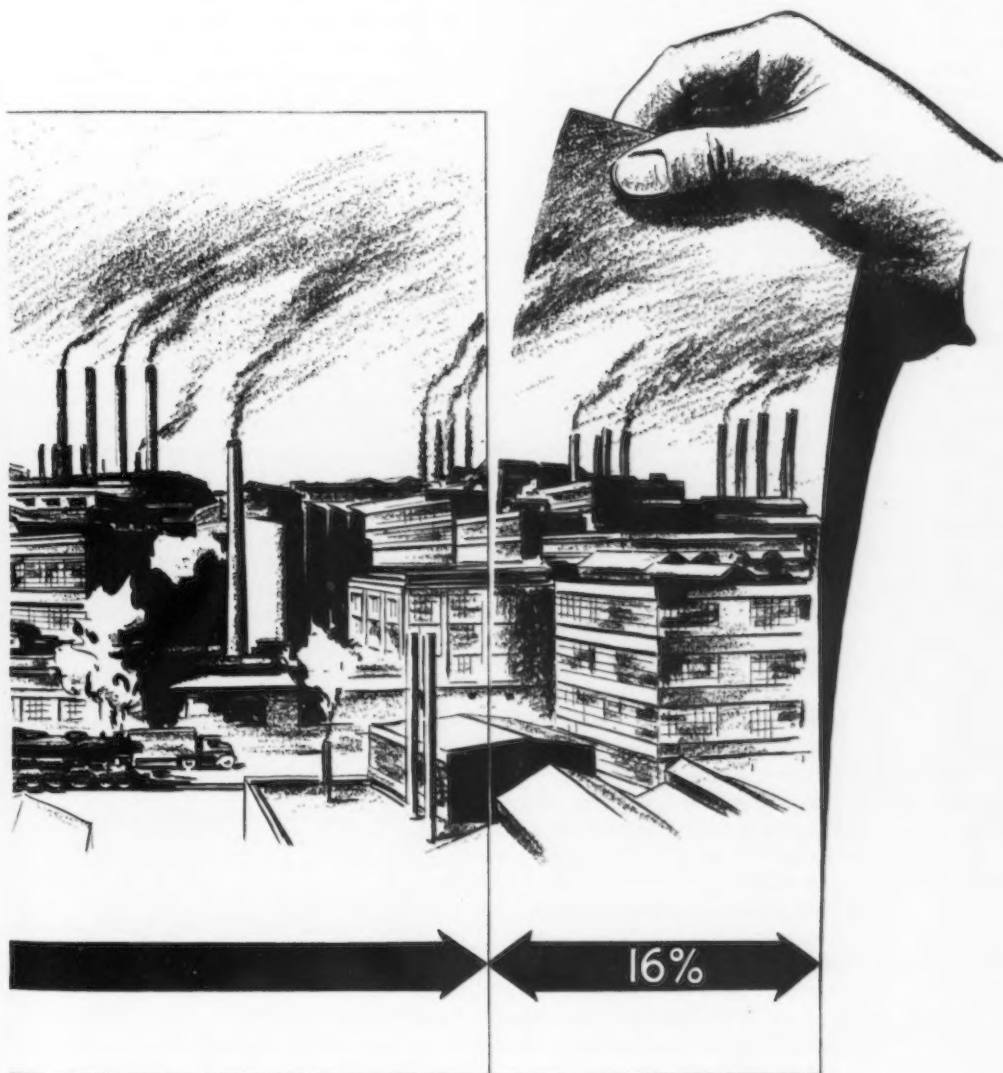
Now the business man in this country, and the civic leader as well, must admit that if he knew the answers to all of these charges or a majority of

them, he has hidden that fact remarkably well.

It is not alone the working man who has listened to the statements of demagogues, and it is not only demagogues that are making these statements, but men high in the executive branches of our greatest institutions of learning, well-known figures in the church, and leaders of many other American groups are making the charges either in a major or minor degree.

What is the truth? Well, a genuine miracle has happened. The dema-

gogues have been answered—they have been definitely answered by the most reliable and authentic source existing in the world today. Their wild inflammatory stories are proven false by the Government of the United States, and we could not ask for a much more dependable source of information than that. It is quite true that up to two years ago a demagogue could make most any kind of a wild charge regarding the distribution of our national income, and get away with it, just as any one could say that the canals on Mars were 200 ft. deep.



ONLY 16 per cent of our entire American manufacturing industry is being operated for the benefit of investors, owners, inventors, etc.

text, suitable for use on bulletin boards, will be supplied on Service Department.

And who could disprove that statement? And it was much the same with the charges made by demagogues up to the week the United States Government released a book that is rapidly becoming nationally famous, namely, "NATIONAL INCOME IN THE UNITED STATES—1929-1935," issued by the Department of Commerce. This book was a bombshell, but few people saw it. The book has been published for 15 months, and it is only recently that business men have heard about it, yet they should be more vitally interested in its contents than in any other book or publication except the Bible.

The Kiwanis Club of Detroit was addressed by Sherman Rogers, early in August last year. It was an excited group of business men that boiled out of that meeting after it was over. Mr. Rogers had been speaking throughout the Middle West before business groups, giving out the amazing facts contained in this Government research report and calling attention to its existence. I had the good fortune to hear that speech, and I sat like 300 other business men did—literally spell-bound. I had never heard of the book—I had never heard of the figures. If what the speaker said was true, 90 per cent of all the wild charges made from soap boxes and the thousands of inflammatory pamphlets that have been written were fairy tales. When the address was over every man in that room started looking for the book. Few of them were able to obtain one, but those that did soon passed the word to those that didn't. Here is the basic fact, brought out in this Government report. Of all the income produced and paid out by the manufacturers of the United States in 1929, the employees received an average of 83 cents of every such dollar, and of every such dollar of income produced and paid out by the manufacturing industry in 1934 the employees received 84 cents of each dollar. Investigation proves that the same ratio holds good in 1935, 1936 and 1937.

Now at first blush these figures may not seem important to the average executive who has had at least a vague idea regarding the truth of this statement for a good many years, but the value of this report lies in the fact that it is issued not by the manufacturers, who might be charged with bias and propaganda and with hiding certain figures that might alter the full truth, but was issued by a thoroughly non-partisan group of experts who were in a position to seek and find the truth. The Government

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**N**INE-TENTHS, at least, of the discontent and unrest in this country is based upon lack of information regarding the actual distribution of our national income. Through this lack of factual data, political demagogues, communists and professional "world savers" have been able to mislead the masses for their personal benefit and aggrandizement. Thus the fomentation of envy and class hatred between the so-called "haves" and the "have nots" which has been so characteristic of the past several years.

In this article, the author kicks the soap box from under these demagogues by means of a recent survey authorized by President Roosevelt, conducted by Secretary of Commerce Roper, and published by the U. S. Government Printing Office. This survey reveals the astonishing fact that employees receive 84 cents out of each dollar of national income generated by the manufacturing industries of the United States.

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has access to records that no one else has access to. Now, let's see what these figures mean to the average man. They mean the difference between a zealous Bolshevik and a sound, loyal American, because when all is said and done extreme radicalism and class hatred are, in the main, caused by economic fallacies. A little investigation will prove this point, and you can make that investigation on any main street in your own town in half an hour.

When this booklet was published a survey was made in Chicago, where 518 men were interviewed coming out of factory gates. Each person was asked how much of each income dollar produced by the manufacturer he thought found its way into the pay envelopes of the workers. The results of that little investigation were astonishing, and tell an amazing story. Well, here is the answer: Out of the 518 persons, 135 thought they got less than 3c. of each dollar of income produced in their industry, 378, including the 135, were of the firm conviction that they got less than 5c. out of each

dollar, and only 4 of the entire 518 thought they got as much as 10c. of each dollar of income produced.

Now, let's analyze these striking misleading beliefs. If what these men believed to be true regarding what they received from the dollar of income produced by the manufacturer was actually true, they would certainly have been cowards if they were anything else but extreme radicals. If the system of private enterprise, and if our democratic form of government fathered and fostered such an unbalanced and untenable distribution of income produced, it would be high time to change the system of private enterprise and the government that fostered such an outlaw system at once.

In this case, what should we do—throw bricks at these people who were perfectly sincere in their belief, or should all community leaders shoulder the responsibility of placing the facts before them? When you have answered that question in the only way possible, you have pointed out the real reason for most of the hatred that exists against our economic system, the underlying reason for so much unrest among the average people of this country. Here was a group of honest men, hard-working men and women, more than one-quarter of whom believed that they received only one-thirtieth of the share of income they actually did receive from the income produced by the industries they worked in. Is it any wonder that confusion existed in the minds of these men? Two-thirds of them believed that they received about one-fifteenth of what they actually did receive. Well, the difference between what these men actually received, and what they thought they received is, let me repeat, the difference between a loyal, constructive, sound-thinking American and an extreme radical, eager for any and all changes. Any fair-minded reader will agree to that. It will bring any responsible business man up with a jerk if he will just go out on the street, and find the almost total lack of understanding of the average citizen regarding the distribution of our national income, and yet it is of the most vital concern to every man, woman and child in this country that they do know these facts. And it is most certainly of prime importance to every investor-business man and manufacturer.

I have been a business man engaged in the manufacture of steel products for a great many years. I started in with a small crew. Today the plants



bearing my name are situated in several parts of the United States and Canada. I have always imagined I was a good business man. When I heard this speaker before the Kiwanis Club I suddenly realized that during all of these years I, as a business man, had ignored my full responsibility to the people working for me, to their families, and to all the people in the communities where my factories are located. Had I spent just a little time, I could have made it possible for all of these people to have been completely familiar with the real facts concerning the distribution of each dollar that our company took in, and there is not the slightest question in my mind had we done so, we would have performed a service of tremendous value not only to our company, but to the community and nation.

The speaker at the Kiwanis meeting made another statement that has flitted back and forth in my mind ever since. He said—"whenever any large number of people follow the wrong leader, it is not because the wrong leader is smart, it is due solely to the fact that the right leader is asleep at the switch"—and the more I turn that statement over in mind, try to escape it as I will, I am forced to admit it is the truth.

There has been far too much recrimination—most of us have acted very much like a group of excitable school children. We have talked about formulas—we have talked about panaceas, and yet, when we have looked them all over, we know there is only one solution to any problem, and that is the truth—the plain, basic truth, vigorously but tolerantly told.

Certainly business men have made mistakes—labor leaders have made mistakes—political leaders have made mistakes—farmers have made mistakes—and probably no one group has made more than the other. Ninety per cent of these mistakes have been sincerely made, and why should we waste valuable time criticizing them now? It is my firm belief that the time to criticize is past; the time to solve problems by facing them is here.

This Government survey is a thorough one—it goes into all branches of the trade—all branches that go to make up the life of a great nation. It deals with agriculture, and it points out how many dollars were taken in—how many dollars were paid out—and who received those dollars. It does the same with manufacturers, with mining and quarrying, with electric light and power, with transportation, with construction, with finance, with com-



L. A. YOUNG

President, L. A. Young Spring & Wire Corp.

munication, with trade—both retail and wholesale, with government, and with service—thoroughly covering all branches where people are gainfully employed.

In mining and quarrying, for instance, the employee received 84c. of each dollar, and the bankers, the stockholders, the bondholders, and the incorporated and unincorporated owners received the balance.

Now, let's come to a service we are all interested in, the wholesaler and the retailer. Of all the income produced by the retail and wholesale trade, the stockholders and bondholders, and incorporated owners and the bankers for interest, received only 4c. of each dollar of such income produced and paid out, and since 1929 both wholesalers and retailers have paid out more than they have taken in, and have been calling on their surplus for several years to make up the deficit.

Let's take a look at the rest of the picture. The employees receive in their pay envelopes 72c. of each dollar of income produced by the retail and wholesale trade, and then we come to the entrepreneur—that is a word for you. It doesn't mean what you think it does. It means an unincorporated owner; and in the retail trade it means 1,432,000 little shop owners too small to afford the expense of incorporating. You will find these entrepreneurs in little stores and small shops in every city, village and hamlet throughout the country. You will find, as a rule, husband and wife—sometimes a son and daughter will be the sole help within the establishment. The Government in its survey says this:

"As the assumption was made that entrepreneurial withdrawals in retail trade equaled the average full-time wage, these may be considered to be largely in the nature of labor income. Combined with compensation of employees in this branch of trade, they constitute from 94 to 96 per cent of total income paid out."

Now, think over those figures a moment, and they will dumbfound most of us. Any time that labor income amounts to 94 to 95 per cent of the total income of any great industry, we have a distribution of income more fair and more just than exists in any other country on earth.

What this remarkable Government research has done is this—it has firmly established the wisdom and the soundness of George Washington and his compatriots in the Constitutional Convention, and it has about completely demolished the visionary theories of Karl Marx as far as the United States is concerned, but these facts do no good boxed up in the printing department in Washington. This book will settle more arguments regarding the American economic system than all of the books now cluttering up libraries, and for once we can compliment the Government unstintingly on a real accomplishment. This book is written in language that any grammar school child can understand. If we get the truth contained in this book into the hands and minds of the people of the United States, the intense animosity that has dethroned reason, and the scales of prejudice that have blinded the eyes of millions will largely disappear, and we will all be able to sit down across a table as associates in the building of great enterprises, work out our problems on a basis of mutual respect, and by so doing gain the co-

(CONTINUED ON PAGE 83)



# Brass and Aluminum Castings\*

CASTING ingots  
at the plant of  
American Brass  
Co. Photo by  
Richie.

(The fallacy of "Barbeque" melting, and  
other common practices which inevitably  
lead to defective castings.)

By A. FRITSCHLE  
American Smelting & Refining Co.

QUITE likely very few foundrymen have ever heard of the "Barbeque" method of melting metal, as the writer has termed it. Nonetheless, all foundrymen are quite familiar with the process as it is almost universal practice among brass and aluminum furnace tenders. It follows the lines of least resistance, and while it may save a few minutes in bringing down a melt, this practice is very bad and is most closely related to annoying casting failures, often without the foundryman even suspecting the reason.

This faulty melting practice is brought about by merely placing part of the metal charge (ingots, gates, sprues and misrun castings) on the lid of the furnace so that the metal extends partly or all the way across or up through the opening in the lid, in order to pre-heat and melt this part of the furnace charge and save time. When the true facts are known, however, this is a most expensive and dangerous way to "save" time.

The idea of pre-heating part of the furnace charge is reasonable, but the method employed is *definitely* wrong. Never should the metal charge come in direct contact with the furnace flame for any period of time beyond a

few seconds; for when metal is allowed to "soak" directly in the fire it becomes badly contaminated with harmful gases, and the chemical reactions ruin the mix.

Heat expands this metal before it reaches the fusing point and thus opens the pores, which permits combustion gases to permeate the solid metal. When these gases (hydrogen, oxygen and carbon monoxide), which are the products of combustion within the furnace, are absorbed by the solid metal, chemical reactions take place. Therefore, when fusion occurs shortly thereafter, these gases become *dissolved* in the molten mass.

By no means is this the only trouble-producing condition created by this particular melting procedure. For instance, as the metal gradually reaches its fusion point and melting progresses, innumerable small drops of molten metal "ooze" out of the still more or less solid mass. Most of these liquid drops of metal, perhaps, quickly find their way down into the molten mass in the crucible below, but a great many of these molten globules remain stationary just long enough—right where they are formed—to become enveloped in a thin film of oxide.

This oxide film immediately retards the flow of these globules and further delays their descent into the

crucible below. In the meantime, the oxide film becomes heavier and more pronounced and the globules become less fluid as they continue to be exposed to the furnace flame. The cycle continues until finally this oxidized or "burnt" (as the foundryman calls it) metal, drops down into the crucible below where the *oxides are introduced right into the rest of the molten metal charge*. Obviously, therefore, this faulty melting practice at one stroke introduces *both oxides and dissolved gases* directly into the molten brass or aluminum, which the foundryman expects to pour into good sound castings!

Some of the dissolved gases come out of *solution*, as it were, but they do not really get out of the castings; the evidence is generally found right under the skin or all the way through the structure when the castings are machined. To really remove dissolved gases requires a remelting operation or boiling, or a special treatment with considerable zinc (about 1 per cent) and phosphor-copper (about  $\frac{1}{4}$  per cent) which might conceivably alter the composition beyond allowed limits and also result in the molten metal cutting into the sand and core.

It is perfectly feasible to pre-heat castings, gates, sprues, etc., for later

\*Abstract of lecture presented before the American Foundrymen's Association at Rolla, Mo.



introduction as the initial charge melts down, thus maintaining melting schedules, without allowing this part of the charge to "soak" in the fire. Simply place them on top of the furnace *far enough away* from the opening in the lid so that the flame doesn't touch the metal. They will be found sufficiently hot when pre-heated in this manner to go into solution in very short order.

Even under favorable operating conditions and close melting control the foundryman has plenty of annoying problems to worry him without going out of his way to set the stage for more trouble. It is a conceded fact that foundrymen cannot operate under the very close supervision and control that is possible in a research laboratory. It is simply necessary to have more flexibility of action and "elbow room" in operating a foundry.

For these and other reasons it is a very good idea for the foundryman to check up closely on his melting practice and to train his furnace tender how to handle his metals during the entire process of melting. The furnace tender's job is very important, although, in the author's 30 years of contacting brass and aluminum foundries all through the Central-Western and Southern parts of the United States, it has been found that in a great many cases this important furnace tending job is delegated to a "dense," uneducated laborer, or to a raw novice who was incidentally a general "flunky" around the place.

#### Safety Factor Advisable

It is a very good idea to adopt some definite and dependable safety factor in connection with melting practice, so that a whole heat and all the time, labor and overhead expense involved will not be endangered. A hit-and-miss procedure is costly under any conditions. In line with the foregoing the author would recommend that every heat of red brass and tin-bronze be deoxidized *before* tapping out any metal or pulling the crucible from the furnace. Phosphor-copper is the usual medium employed for this purpose by the majority of brass foundrymen. But in this connection the author has found that many foundry foremen and furnace tenders operate upon the theory that if 1 oz. of phosphor-copper added to 100 lb. of brass would noticeably improve the quality, then the addition of 6 oz. per 100 lb. would be six times as satisfactory. This theory, however, most certainly does not work out in practice and should by all means be discarded.

The *method of introducing* phosphor-copper into molten metal is quite important and to a considerable extent controls the results obtained from phosphorus additions. In this connection the writer has time and again observed furnace tenders throw their phosphor-copper right on top of the slag, charcoal or dross-covered molten metal, and then search about for a suitable iron rod to stir the metal and work in the phosphor-copper. In the meantime, while the furnace tender was endeavoring to locate his elusive stirring rod, most of the phosphorus content burned out, and the important beneficial effects were thus dissipated to the vanishing point.

In the vast majority of cases a minimum of phosphor-copper should be used, but in every case it should *immediately* be plunged to the bottom of the molten metal in the furnace and then stirred around vigorously for at least 5 or 6 sec. In this way a small amount of phosphor-copper will have decidedly more effect than a much larger amount carelessly thrown on top of the slag-covered metal surface.

A somewhat more efficient and more dependable method of deoxidizing, and especially effective when running pressure castings, is to *first* introduce a small quantity of zinc (3 to 8 oz. per 100 lb. of metal charge, according to the alloy) into the molten metal in the furnace about 8 to 10 min. before tapping out any metal or pulling the crucible. The zinc, like the phosphor-copper, should not be thrown on the surface of the slag or charcoal covering of the molten metal; it should *immediately* be plunged to the bottom of the molten metal and stirred around very vigorously for 5 or 6 sec. Then about 5 min. after introducing this small quantity of zinc, the phosphor-copper should be introduced in line with the foregoing recommendation.

Probably many foundrymen would be interested in knowing why zinc and phosphor-copper are recommended in red brass and bronze, since both, individually, are deoxidizers. The reason is that the zinc serves not only as a first-rate deoxidizer, but the somewhat larger volume of zinc causes a violent boiling action which materially assists the upward movement of oxide particles, which become entangled and are held in suspension. Whenever molten metal is deoxidized and suspended oxides are even partially removed, the metal's fluidity is naturally improved.

The phosphor-copper addition, besides deoxidizing the melted alloy, greatly liquefies the molten mass for a brief period. Obviously a very thinly-liquid mass will, through the force of gravity, more readily and more definitely free itself of suspended oxide particles. In most cases there is no desire to retain the phosphorus as an element—merely the *refining effects* of the phosphorus are desired. That's why, for general practice, the author recommends adding phosphor-copper about 4 or 5 min. *before* pulling the crucible or tapping metal from the furnace.

If phosphor-copper is added immediately before pouring the metal into the molds, as is the practice of a great number of foundrymen, quite likely enough phosphorus gas will be retained in the metal stream to cause porosity in the castings. The foundryman may also find a definite tendency of the metal to cut into the sand and core.

The author's observations along these lines have indicated numerous instances where the furnace tender, in order to avoid phosphorus gas in the metal, placed his phosphor-copper in the bottom of the crucible along with the first part of his metal charge. Upon checking up on the results, it has been found that the castings showed all the earmarks of insufficient deoxidizing. Upon changing the method of deoxidizing and introducing a somewhat smaller quantity of phosphor-copper, after a small zinc addition, the results were very satisfactory.

Deoxidizing yellow brass is a different proposition. A considerable excess of zinc is already present, which produces oxides and gases; therefore, nothing is accomplished by trying to deoxidize by adding more zinc. As is known, aluminum is sometimes used, but it is seldom permissible for various good reasons. Silicon-copper is a very excellent deoxidizer for yellow brass. It doesn't discolor the skin of the castings and, upon remelting the gates, sprues, etc., it does not make the metal dirty and drossy, as does aluminum.

The writer has found that the addition of manganese-copper, 2 to 3 oz. of manganese-copper to 100 lb. of metal, introduced into the molten mass about 10 min. before pouring-off, greatly improves the soundness of yellow brass castings. This manganese-copper addition followed 5 min. later by 1 to 1½ oz. of phosphor-copper, is hard to beat. But for everyday practice 1 to 1½ oz. of phosphor-

copper per 100 lb. of metal is a very satisfactory deoxidizer for yellow brass under almost any conditions. And for gas cocks and valves, which must not permit the odor of gas to permeate, 2 to 3 oz. of phosphor-copper is being used every day with fine success by one large brass founder.

In closing, there is one more point that, although only remotely connected with melting practice, is important to include in this discussion, i.e., the use of gates or sprues as "coolers" when the molten brass is too hot. As a general proposition there is no excuse for over-heating the brass, although in certain cases where heavy castings are to be run immediately after pouring thin ones, it is necessary to bring the brass out very much on the "hot side." In the latter event simply allow the crucible of hot metal to stand a little while after pouring the light castings, until it has cooled sufficiently, and stir at intervals of 3 or 4 sec. so as to have a uniform distribution of the heat in the molten metal.

The use of "coolers" frequently results in faulty castings, the defects having the appearance of cold-shuts. It is reasonable to assume that since it requires almost one hour (or longer) to bring a furnace charge up to a certain required pouring temperature, it is hardly conceivable that gates or sprues introduced as "coolers" 2 or 3 sec. before pouring-off, can reach the same *complete state of fluidity* as the balance of the molten metal in the crucible; and if this line of reasoning is correct, then it is reasonable to assume that, perhaps, at various times during the pour-off, two metal streams of different temperatures pass simultaneously over the lip of the ladle, thus producing some good castings and some defective ones, all out of the same heat and the very same crucible.

The best way to overcome all this uncertainty is simply to watch melting temperatures closely and outlaw the use of "coolers" under any conditions. The author has frequently observed many cases where the "coolers" were thrown into a crucible of hot metal and the metal thereafter wasn't even stirred. In some cases the molten metal was stirred around for 2 or 3 sec. after the "coolers" were added, but even in the latter event it is quite possible that the gates and sprues were still floating around, *partially* dissolved, similar to a cube of ice in a glass of warm water which has just been stirred.

# Modernizing a Malleable Iron Foundry

By A. E. SCHOBEC

*President and General Manager,  
Jamestown Malleable Iron Corp., Jamestown, N. Y.*

A SURVEY of production methods and metallurgical processes as conducted heretofore in the plant of the Jamestown Malleable Iron Corp. revealed that while its operations and methods were on a par with the majority of plants in the country, there still remained much to be desired from the standpoint of the owner, the customer and the worker.

The need for faster and more efficient production was met by the installation of a modern mold conveyor built in conjunction with a modern sand handling and sand reclaiming unit, with which molders, with a minimum of effort, are able to produce more and better molds over a given period. They are also enabled to devote their entire time to the molding operation as the pouring is done by a separate group.

The continuous molding operation brought about the need for continuous metal, which was met by a duplexing system in which iron with satisfactory chemical analysis is melted in the cupola, thence run into a conventional air furnace, where it is superheated and refined under close control, and from which it is continuously conveyed to the waiting molds.

This system has removed much of the toil from the workers and has almost entirely eliminated the dust hazard, which is everywhere becoming of increasing concern to foundry operators.

Since the second step—and quite as important a step as the first one—in-

volved the so-called annealing of the original hard iron castings, considerable thought was given to the various methods of accomplishing this part of the process. The problem was approached from a metallurgical standpoint with the idea of first producing high quality castings, and second of satisfying the consumer's plea of quick delivery. It was, therefore, determined that since the original hard iron castings are essentially a mixture of iron and carbon, when accompanied by the proper ratios of silicon, manganese, sulphur and phosphorus, they would respond under careful temperature control to heat treatment in an amazingly short time. The problem, therefore, resolved itself into one of carefully applied and carefully controlled heat, under conditions in which there would be no other deterioration. A detailed description of this unit follows. It will be observed that here again a tremendous dust hazard has been eliminated where no packing materials of any description are used.

Previously, the foundry had been using old type periodic furnaces, taking around seven days' time for annealing, loading and unloading. In contrast with the old malleable annealing period, the Jamestown cycle is now 31 hr. This cycle can be divided into four distinct intervals as follows: (1) nine hr. to heat the work from room temperature to the maximum temperature of 1750 deg. F.; (2) ten hr. holding at 1750 deg. F. during which primary graphitization



takes place; (3) two hr. for quick cooling to 1425 deg. F.; (4) ten hr. for slow cooling through the critical range of 1425 deg. F. to 1300 deg. F. During the last interval secondary graphitization (the conversion of pearlite into temper carbon) takes place. The discharge vestibule is water cooled to provide quick cooling of the castings to facilitate handling.

#### Rollers on Trays

In earlier furnaces of this type loaded trays were pushed through the furnace over rollers mounted in the furnace. It was found that some of

tracks extend longitudinally through the entire unit. Inspection of the rollers after each trip through the furnace is easy, punishment upon them is equalized, and repairs are facilitated without the necessity of cooling the furnace.

#### Firing Equipment

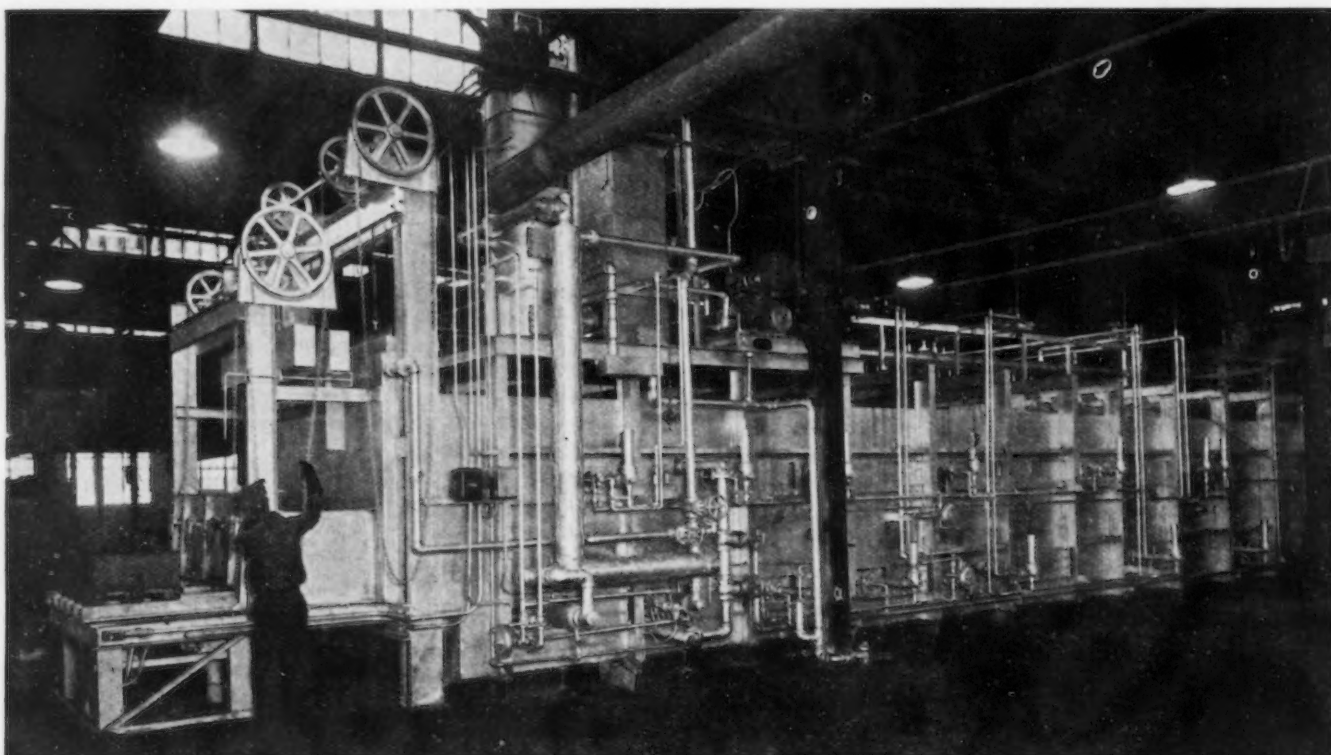
Internally fired tubular elements (radiant tubes) are used as the heating medium. The tubes are made of heat corrosion resisting alloy, 4 in. and 3 in. in diameter. These tubes are arranged both above and below the work throughout the entire length of

venting any leakage of the products of combustion into the furnace chamber in case of tube failure or leakage of a welded joint.

The fast cooling zone, where the temperature is dropped from 1750 deg. F. to 1425 deg. F. in 2 hr., is equipped with special alloy tubes through which cooling air is sucked by eductors using air from the main blower.

#### Atmosphere Gas

The function of the atmosphere gas is to blend or neutralize the CO given off by the castings with proper amount



**V**IEW from charge end, showing loaded trays about ready to enter the charging vestibule. Atmosphere unit may be seen on top of the furnace.

the rollers wore and, being always covered with work, could not be inspected easily. If trouble developed, it was necessary to cool the furnace for repairs and until it had been cooled, the extent of the damage could not be anticipated, making it impossible to estimate how long the furnace would be down. Certain rolls were punished more severely than others, being in the constant high temperature zone at all times.

In the new Jamestown furnace, each tray is equipped with its own rollers or wheels, fastened to its bottom. Tray and wheels are pushed through the furnace on channel-type tracks. The heat-resistant alloy

the furnace structure to provide for the proper heating and cooling rates.

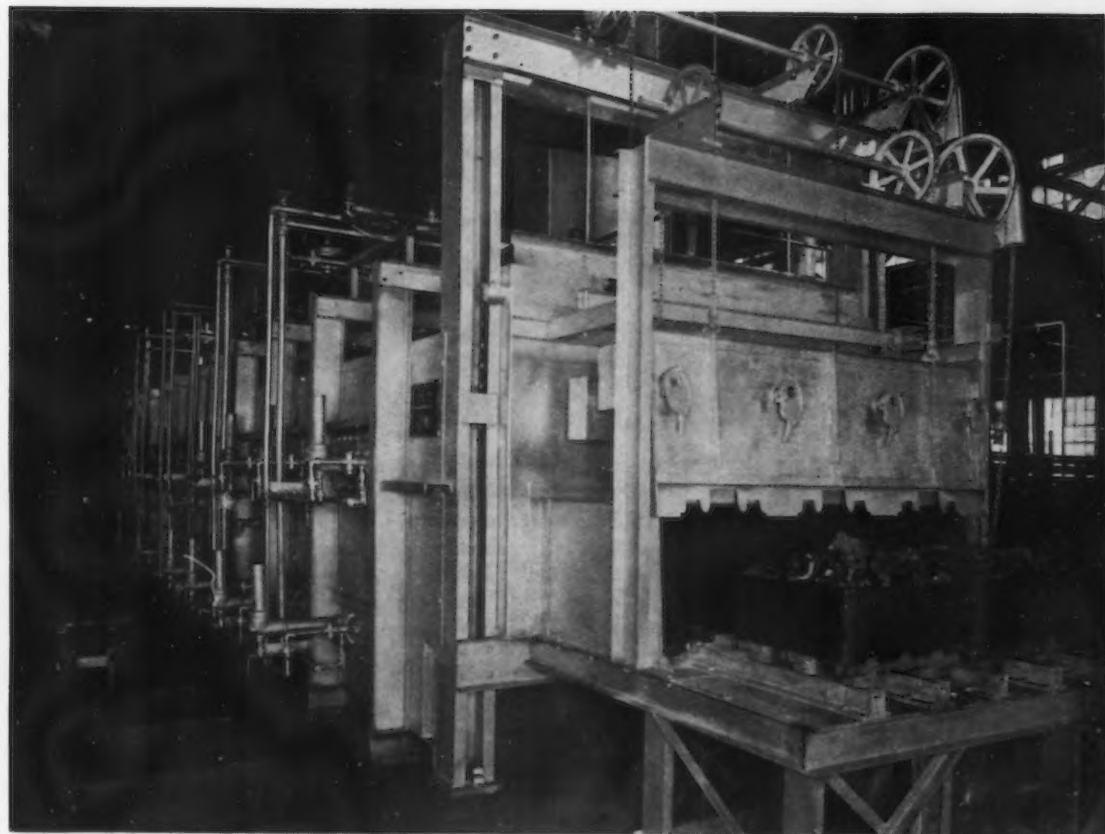
Each radiant tube is provided with a specially designed combination pre-mix and diffusion type of burner, so that each tube can be controlled independently. The special function of this burner is to produce a long radiant flame inside of the tube, which radiates through the tube walls without producing the excessive temperature differential found necessary when using entirely pre-mix gas and air for combustion. Each tube is equipped with an exhaustor at the outlet end to facilitate control of the flame length. These exhaustors also create a negative pressure inside of each tube, thereby pre-

venting any leakage of the products of combustion into the furnace chamber in case of tube failure or leakage of a welded joint. It is customary to maintain an atmosphere from two to three parts of CO to one part of CO<sub>2</sub>. Usually this analysis is from 14 per cent CO to about five per cent CO<sub>2</sub>.

This atmosphere gas is produced by controlled partial combustion. Gas is partially burned in a combustion chamber and the resultant products of combustion refined and cooled so as to rid the gas of detrimental water vapor. Before being introduced into the furnace they are first reheated utilizing the heat generated in their combustion.



CHARGING end of the new furnace at Jamestown Malleable Iron Corp., Jamestown, N. Y., showing the new type trays ready to be pushed into the vestibule.



The furnace is provided with vestibules having doors on each end to prevent air infiltration when charging and discharging.

#### Dimensions and Capacity

The total length of the furnace between the inner vestibule doors on

each end is 53 ft. Internal width wall to wall is 8 ft. Total overall outside dimensions are 12 ft. in width by 67 ft. 3 in. long.

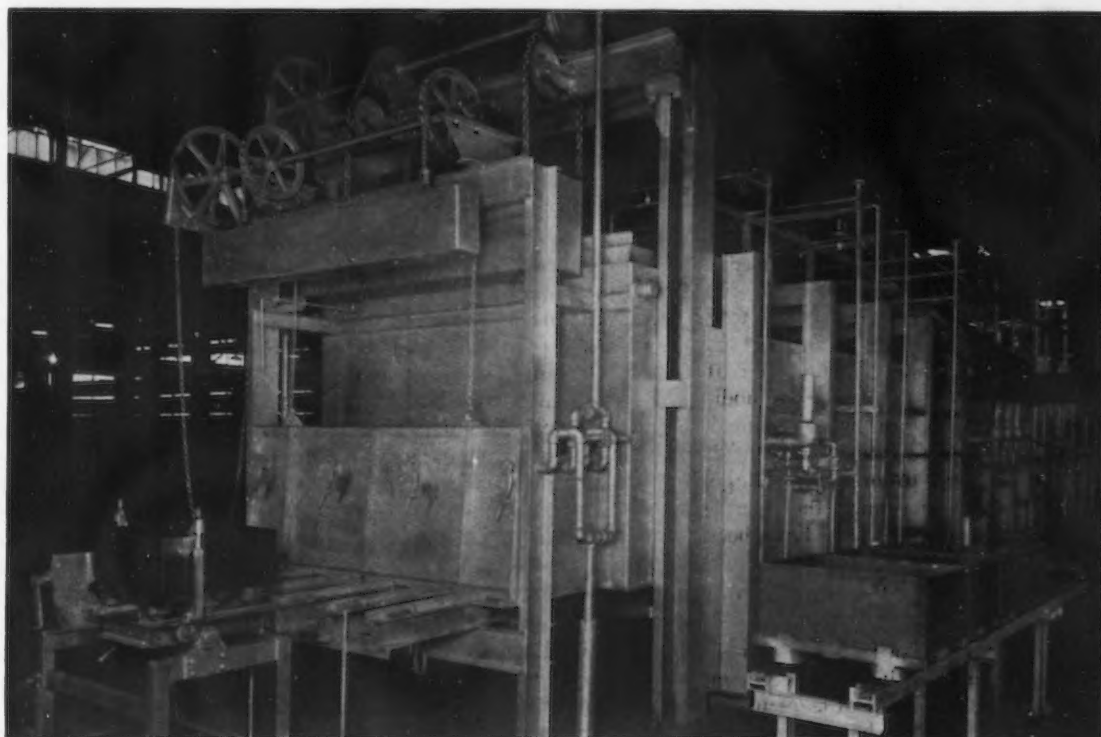
Total fuel consumption is 3300 cu. ft. of 1050 B.t.u. gas per net ton of work. Capacity of the furnace is 1250

net lb. plus 500 lb. of trays, rollers, etc., per hr. or 15 tons of work per 24-hr. day.

Three rows are provided for trays, each row holding 26 trays, making a total of 78 in the entire furnace at

(CONTINUED ON PAGE 94)

VIEW of discharge end of furnace, showing tray dumping mechanism and return conveyor. Water cooled tubes in discharge vestibule finally cool the work to facilitate handling.



# Foundrymen Argue Cupola

## Griffin Hot Blast

By L. H. RUDESILL

*Griffin Wheel Co.*

THE basic principle of the Griffin hot blast process is to utilize the combustible waste gases coming from the cupola. In applying the Griffin process a standard cupola is used in the ordinary manner, with an upper wind box added below the charging door. Through this second wind box a portion of the gas of combustion is drawn from the cupola and passed into a combustion chamber where the inflammable carbon monoxide gas is burned at a temperature of 1700 deg. F., developing an increased amount of heat which passes through the tubes of the pre-heater and up through an exhaust fan. The air for the cupola blast enters the pre-heater among the tubes, which are heated with the cupola gas, and passes on to the cupola through the ordinary wind box.

There are five doors in the various chambers of the heater for the purpose of observing the entire operation and for examining the combustion chamber and exhaust chamber. It is accessible for periodical examination, and the simplicity of the design makes the maintenance of this type of unit of minor consideration. The design of the pre-heater has been greatly modified since the first units were installed. The old units were somewhat difficult to maintain and to prevent leakage, while on the newer units the operating economy and efficiency have been increased, and the warpage and leakage of the heater have been entirely eliminated.

An accurate record shows that 12 heaters on cupolas that have been operating for 10 years in the plants of the Griffin Wheel Co. have been main-

tained over this period at a cost of only 1.60 per ton of product made. During this time about 1,897,970 tons of product were made and the average coke ratio, including the total bed coke, was 185 lb. per ton of metal melted. This ratio represents a saving in coke of 70 lb. per ton, and amounts to 35c. per ton of metal melted.

One of the outstanding improvements that come with the installation of the Griffin hot blast process is the uniform increase that is obtained in the metal temperature. With a blast temperature of 600 deg. F., the metal temperature varies in proportion to the coke used per ton of metal charged. A coke ratio of 16 to 1, or 125 lb. of coke per ton, will produce a metal temperature at the spout of 2650 deg. F. When higher metal temperatures are required the ratio is naturally decreased and a temperature of 2800 deg. F. is easily obtained with a coke ratio of 10 to 1.

As the maximum blast pressure for melting as high as 28 tons per hr. is only 8 oz., the metal is always melted under the most favorable reducing conditions. The result of this operation is a quiet molten metal free from any evidence of iron oxide or other non-metallic inclusions. This type of metal is known to have a lower hardness for a given chemical analysis. Its machinability is greatly improved and it will be much less likely to chill on castings that have thin edges than a metal melted with the conventional cold blast cupola. A corresponding increase in the fluidity is also obtained because of the favorable melting conditions.

The application of the Griffin hot blast process to date has been very wide. Installations are being used extensively in the cast iron industry, both for miscellaneous types of gray iron and for automobile castings. It is being used in the malleable industry in conjunction with the malleable iron

furnace as a duplex process. The latest installations are being made in the steel industry to make a refined metal by a recently developed process.

## The Acipco Hot Blast Cupola

By J. W. COTLIN

*American Cast Iron Pipe Co.*

THE cupolas in our plant are operated to meet time, temperature, quantity and quality demands. Although our operation is continuous, the melting rate must be quickly varied over a wide range, and at times the cupolas are required to stand-by. The iron must be hot under all melting conditions and after a shutdown it is necessary that the first ladle be hot.

To meet these conditions, our old cold-blast cupolas required a heavy coke burden and high blast pressure. As our foundries increased in capacity it was evident that some means of producing high melting temperatures with a lower coke burden would have to be found.

The idea of passing the blast through cast iron sections set in the wall of the cupola below the charging door and above the melting zone was conceived. Experiments were made to determine the proper location and shape of the iron sections, and out of these experiments the Moore hot-blast cupola was developed. The first installation was made in November, 1927.

A vertical section of this cupola is shown in Fig. 1. The wind from the blower enters the bustle pipe and passes through riser pipes into castings. Those castings were made of cast iron 1¾ inches thick and spaced so that the front part forms the abrasion zone of the cupola. One casting is used for each tuyere. The wind passes out through the bottom into a

# Problems

distributor which runs around the cupola and serves to equalize the air flowing through the castings. From the distributor the wind passes on down through cast iron downcomers and into the cupola through the tuyeres.

The connections between the tubes and the bustle pipes are made wind-tight with glands and high temperature asbestos gaskets. The tubes are anchored at the bottom, throwing all the expansion to the return bends above. The return bends are machined on the inside and the straight ends of the tubes are provided with three cast iron seal rings, or piston rings, making wind-tight expansion joints. Each return bend is suspended from a bracket with a horizontal pin through a lug on the top of the casting in such a manner that the bend may be swung out. This is a very convenient construction and maintenance feature.

## U-tubes Replace Castings

To improve our cupola operation the idea of replacing the heavy castings with a series of U-tubes was developed, and in 1935, the first installation of this type of hot-blast equipment was completed.

The melting zone is lined with refractory blocks up to the bottom of the tubes. Standard 22 in. bricks are used between the tubes and the shell. Above the tubes iron bricks are used for the lining, which, with hot-blast equipment, are not subjected to such extreme temperature conditions as they are with the old cold-blast cupola.

The principal cause of tube failure is the heating and cooling cycles through which it passes. The length of the heat apparently has very little to do with the life of the tube. From a series of heats, ranging from 3 to 16 hr. each, it has been found that the average life of a hot-blast tube is approximately 150 heats.

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**T**HE foundry industry's insistent demand for better iron at lower cost has led to the development of various refinements in cupola operation and design, notably mechanical charging and hot blast equipment. At the recent Birmingham cupola symposium, held under the joint auspices of the Birmingham chapters of the American Foundrymen's Association and the American Society of Mechanical Engineers, considerable information was presented on this subject at a two day session attended by over 600 foundrymen. Presented herewith are abstracts of some of the papers read at the meeting. Space limitations make it impossible to publish all the excellent material presented. Particularly does this apply to the very interesting discussion of balanced blast equipment presented by W. L. Roueche, Sr., of McWane Cast Iron Pipe Co. However, data of a very similar nature will be found in an article written by Mr. Roueche for THE IRON AGE and published in the issue of Dec. 2, 1937.

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Operating a cupola on alternate days affords ample time for ordinary repairs and tube replacements. We usually make all the required repairs and replacement in about 3 hr. with a crew of four men. The heaviest section weighs only 400 lb., and does not require special handling equipment.

This type of cupola is very flexible as it may be operated through short shutdown periods and the melting rate varied over a wide range without appreciable loss of temperature. On long heats with high blast pressure the tuyeres remain bright throughout the heat. They do not clog or nozzle causing oxidation as they do with cold-blast under these conditions.

Present cupolas are operated with an iron to coke ratio between charges of from 10 to 1, to 12 to 1. On the old cold-blast cupolas for this service, it was necessary to use a ratio of  $7\frac{1}{2}$  to 1. This represents an average saving of about 30 per cent on coke charge.

Very good results were obtained with this type of hot-blast. On a 72 inch cupola equipped with eight cast iron sections and tuyeres, the iron to coke ratio between charges was increased from  $7\frac{1}{2}$  to 1, to 10 to 1, the average melting rate was increased

25 per cent and the average blast pressure was reduced from 20 oz. to 14 oz. Temperatures were maintained at the proper point and even the temperature dips were kept in the region of good iron.

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## Mechanical Cupola Charging in a Pipe Foundry

By M. KUNIAISKY  
*Lynchburg Foundry Co.*

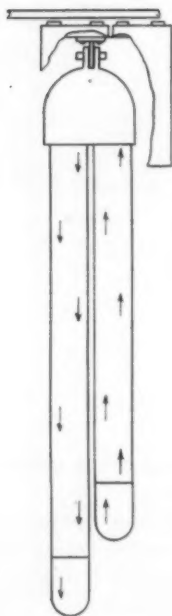
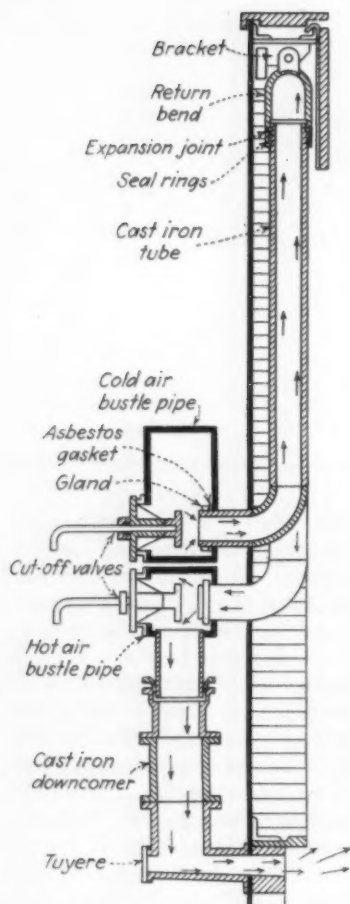
**T**HE pipe foundry in question produces pit cast pipe 12 ft. long ranging in size from 3 in. to 60 in. in diameter, large fittings and a wide variety of special shapes for use in the chemical industry.

\*The plant is equipped with four cupolas each 96 in. in diameter inside the shell, lined to 73 in. above the tuyeres and 78 in. below. Each is capable of melting from 15 to 18 tons per hr.

When charging one cupola by hand, two crews of four men each were required in the iron yard to load the 4000 lb. cupola charges. Thirteen additional men were necessary to handle actual cupola charging, to tend the cupola, to deliver the iron, etc.

The complete mechanization of the





AT LEFT  
FIG. 1—Construction details of the Acipco hot blast system.

cupola charging operation required the installation of an iron yard crane and magnet for loading the cupola charges, a Shepard electric charging crane complete with nine charging buckets of special design, cutting a hatchway 21 ft. by 15 ft. in the charging floor, enlarging the charging door openings in the cupolas, and other minor changes.

#### Scrap and Pig Unloaded by Magnet

Along one side of the crane runway in the iron yard is a standard gage track where incoming shipments of pig and scrap iron are placed prior to unloading into bins or loading directly into cupola charging buckets. The 5-ton Shepard-Niles yard crane has a maximum charging capacity of between 30 and 35 tons per hr. Just outside the crane runway and on the opposite side from the standard gage track are a series of overhead coke bins with a capacity of approximately 450,000 lb. of coke. A 36 in. track runs from the cupolas to the coke bins and the iron yard. Two track scales provide accurate weighing of all coke and metal charges.

The special cupola charging buckets are cylindrical in shape, being 58 in. in diameter and 40 in. deep. There

is a partition in each bucket which serves as a stiffener and there is an eye in the upper part of this partition into which the charging crane hook is fastened while being raised and lowered from the ground level to the cupola charging door. The bottoms of the charging buckets are made in two semi-circular pieces hinged at the middle, that is across the diameter. They are held in place by means of a simple latch mechanism controlled from the crane cab.

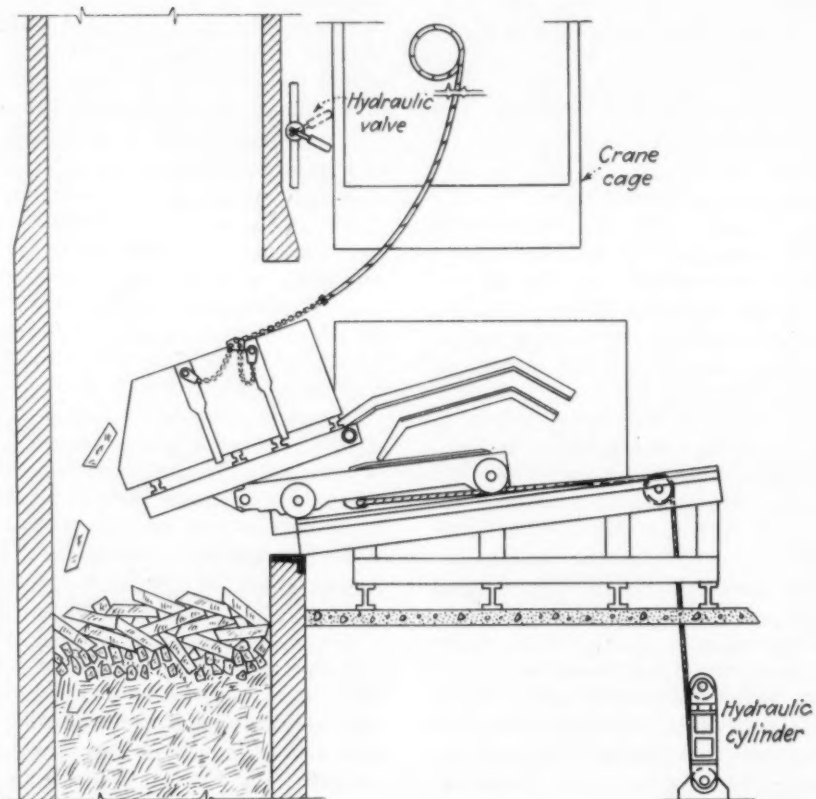
#### Making Up Charges

The actual operation of the mechanical charging equipment consists in making up three metal charges and three coke and limestone charges before the cast starts. The metal and coke are not mixed but are loaded in separate buckets. While these charges are being placed in the cupola three other buckets are being filled in the iron yard with the crane and magnet. When operating one cupola with the mechanical charging equipment, one iron yard crane operator loads all metal charges. A motorman who operates the Plymouth locomotive and a hook-up man who works on the ground beneath the cupola charging crane bring all of the iron and coke charges to the cupola. The charging crane operator does all of the charging.

When operating two cupolas simultaneously three additional, or a total

BELOW

FIG. 3—Sketch shows the manner in which the Acipco charger releases the charges into the cupola.



of 11 men are required. These include a second cupola liner and a liner's helper who helps on both cupolas and also does the daily repair work on the cupola troughs.

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## Whiting Wishbone Charger

By A. W. GREGG

Whiting Corp.

**T**HE Whiting Wishbone charger consists of a charging bucket with a flanged top, a wishbone-shaped cast-

crane: (1) The overhead type designed to serve two cupolas; (2) the underslung trolley type designed to serve two or more cupolas; (3) the horse-shoe type on a fixed runway (which may be extended into the stock yard if desired) which serves one cupola only; and, (4) the monorail type of trolley which serves one cupola or with a series of switches, may serve several cupolas.

The first advantage derived from a mechanical charging system is a saving in labor costs. In one plant which previously used hand charging and melted 10 tons per hr., the installation

inside the cupola and safely suspended on the wishbone casting. Simplicity of operation is its best guarantee of complete safety.

Crane type charging, of course, eliminates the necessity for a charging platform and an elevator. Where new construction is being considered this means a great saving in the original investment for the building.

In many cases of existing equipment, charging doors are too low and the installation of mechanical charging equipment makes it possible to raise the charging door, which, in turn, means greater fuel economy. In

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**FIG. 2—**Whiting wishbone charger, designed to serve either of two cupolas, as installed in a foundry of the Fairbanks Morse Co.

• • •



ing fastened to the shell of the cupola and a crane trolley with a jib to hoist the bucket and place it in the cupola supported on the wishbone casting as shown in Fig. 2. The bucket is supported by its flanged top on the wishbone casting and as the crane hook is lowered the materials of the charge are discharged through the bottom. The operator can regulate the dumping of the charge to suit conditions. On earlier charges he can lower gradually, thus allowing material to dribble out slowly, and on later charges the bottom can be released as quickly as desired. No material need be charged by hand even when commencing to charge the cupola.

There are four types of charging

of a horse-shoe mechanical charger, served only by wheelbarrow, permitted two men to replace a crew which numbered five in the winter and eight in the summer. In an extreme case 19 men in the charging and unloading crew were replaced by three men by installing a yard crane, a scale car, overhead coke and stone bins and a wishbone charging crane. This shop melts 200 tons in eight hrs.

Another very important advantage gained by the wishbone charging system is the much safer working conditions which it provides. When the bucket is picked up by the crane the entire load is suspended from the bottom. There are no latches, trip lines, clutches or auxiliary drums. The load cannot be released until the bucket is

one installation where the charging door was only 12 ft. above the sand bottom, but was increased to 20 ft. through the installation of a wishbone charger, the saving in coke alone paid for the installation of the charger in one year.

The wishbone charger can be applied to the largest cupolas which have ever been built in this country. There is a limitation on small sized cupolas because the smallest practical size of the charging bucket is 32 in. in diameter. With a cone bottom discharge a clearance of 10 in. between bucket and inside cupola diameter is required, which means the inside diameter of the cupola must be 52 in. With a drop bottom bucket only a 5 in.

(CONCLUDED ON PAGE 84)

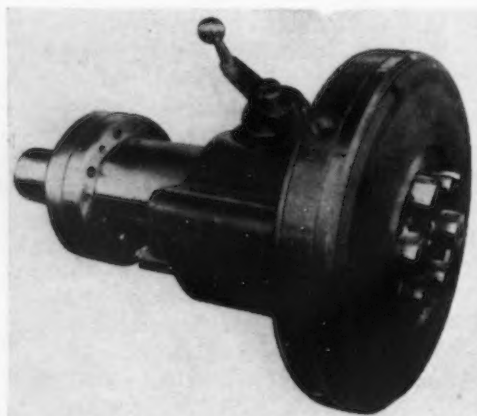
# New Developments in Cutters,

**A**MONG the new types of collapsible die heads for pipe threads is a new circular chaser type for oil well couplings and casing pipe, as well as an unconventional tapping machine for the same application. Also to be found in this review of recent announcements of the suppliers are: a hard alloy thread plug gage, a new type of expansion reamer, carbide tipped milling cutters of the inserted

blade type, a two-jaw chuck, pipe stamp, a new size of permanent magnet chuck, a practical metal container for hack saw blades, lubrication pump, multi-stage diaphragm, pipe and stud extractor, and a number of new wrenches and other hand tools. Among the gages and inspection equipment is seen a toolmaker's microscope, a profile projector, a planer gage and beam compass.

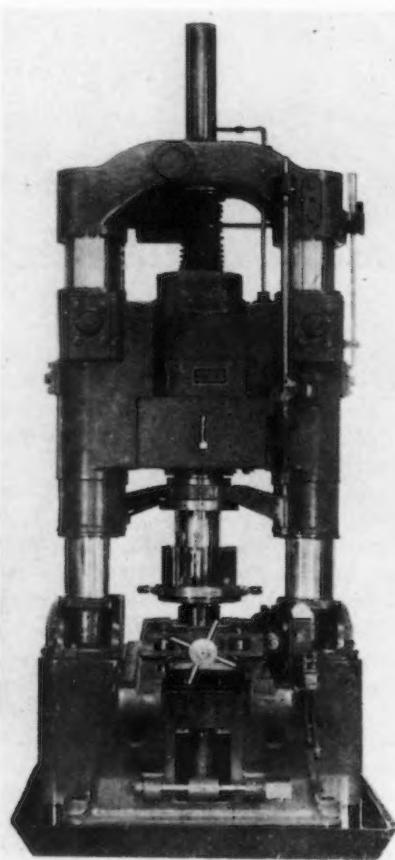
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**A**NEW receding chaser collapsible tap employing circular chasers has been designed by the *Landis Machine Co.*, Waynesboro, Pa., specifically for production tapping of line pipe, casing and drill pipe couplings, including grade Cor D couplings, made from seamless or welded steel or wrought iron. The standard body will cut a thread length of 5½ in. as required for American Petroleum Institute standard couplings as well as for grade D long casing couplings. Known as style CBLM, this tap is said to produce threads well within A.P.I. tolerances.



**T**HE Landis style CBLM receding circular chaser, collapsible tap was developed specifically for production tapping of line pipe, casing and drill pipe couplings in the oil industry.

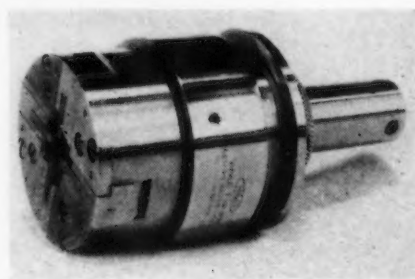
The head of the tap is self-contained and is detachable from the body. One body, the No. 6, can be fitted with 4 to 11-in. heads, covering



a thread range from 4½ to 13¾ in. o.d. The receding action is obtained through a single solid cross-sliding cam, operating on the same principle as the well established style LM tap. The cam is arranged for cutting tapers of 3/16, 3/8 and 3/4 in. per ft. and can be adjusted for in-between values from 0 to 3/4 in.

The circular chasers are mounted on slides held in slots in the face of the head. These slides operate in a tapered seated plunger attached to the receding mechanism in the tap body, and a separate set is required for each thread diameter. In their mountings, the chasers can be rotated to adjust the cutting clearance as required for different materials. The major working parts are of selected steels, hardened or carburized and precision ground. Tripping mechanism is positive, with a large wearing ring area.

In operation, the tap is expanded by a short movement of a crank handle, which through rack and pinion mechanism brings the tripping ring into contact with the face of the coupling. The receding mechanism then begins



ABOVE

**A**S high as 165,000 steel pieces have been threaded without chaser grinding in the new style TMM H & G self-opening die head for small pipe.

o o o

AT LEFT

**T**HIS unconventional Stamets tapping machine is for threading oil field pipe couplings.



# Small Tools and Gages

By FRANK J. OLIVER  
Associate Editor, *The Iron Age*

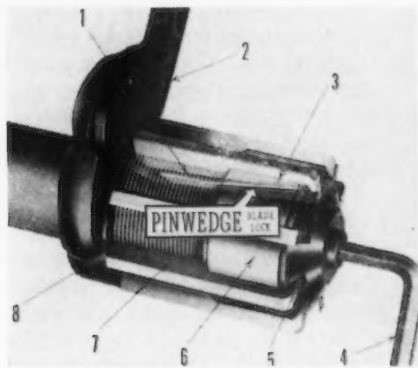
to operate as soon as the tap is fed forward. A latch on the crank allows the housing and trip ring to be moved back to provide access for replacing the chaser slides. The tripping ring is a reservoir type with provision for directing lubricant directly over each chaser.

## Large Pipe Tapper

Hardly to be classed among small tools and cutters, but directly related to the tapping of oil field pipe couplings, mentioned above, is an unconventional type of tapping machine, made by *William K. Stamets*, Pittsburgh. In this machine, illustrated, the upper head structure is supported by two ground columns, which serve as ways, and feed for tapping is provided by a large lead screw, directly in line with the spindle. In addition, the head has rapid traverse in both directions.



**UP** to 40,000 more holes have been gaged with experimental plug gages made of Cro-balt, than with conventional materials. They are made in standard sizes.

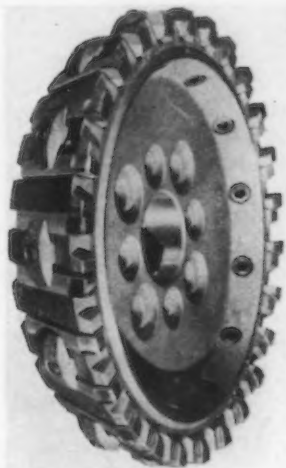


**BARBER-COLMAN'S** Masterall positive, adjustable expansion reamers can be expanded or contracted to "tenths."

The couplings to be tapped are held in a free floating chuck after they have been accurately bored and faced. The finished face of the coupling is placed on a surface plate, normal to the centerline of the spindle. By means of an air cylinder, the chuck is advanced until the coupling is approximately in line with the tap. As the tap enters, the coupling is free to float into alinement. After the coupling is chucked, the cycle is automatic, including tripping and resetting of the tap. After one end is tapped, the chuck retreats and the coupling is rejected. It can then be reversed in the chuck. A floating chuck for holding the coupling on the finished ends only, instead of on the outside diameter, is optional.

Accuracy of lead can be maintained with an error not exceeding 0.001 in. per in., according to the maker. A

**T**HE new Ex-Cell-O standard Carboly-tipped removable blade milling cutter, embodying the "Continental" type RC blade lock.



lead compensator has been developed for greater lead accuracy.

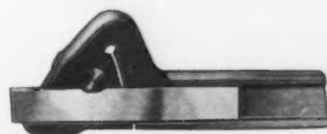
## Self-Opening Die Head

For cutting high quality taper pipe threads on automatic screw machines where the die head rotates, the *Eastern Machine Screw Corp.*, New Haven, Conn., is offering a new style TMM self-opening die head. The No. 101 size shown is 2 7/8 in. in diameter and is suitable for 1/8, 1/4 and 3/8 in. pipe. This style of head is a companion tool to the style TM taper cutting head in quite general use for threading nipples and pipe fittings.

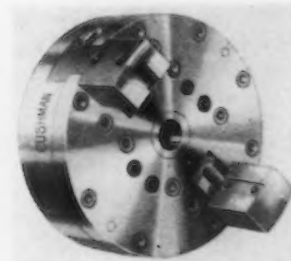
Both styles work on the principle whereby the chasers are caused to re-



**WILLIAMS** carbide turning tool holder comes in five sizes.



**A** GOOSENECK spring construction has been applied to Williams cutting-off tool holders.



**CUSHMAN** 422A-1 two-jaw chuck, shown without the soft top jaws, is intended for precision work.



**THE** Brown & Sharpe cam lock arbor is for use with small milling and other cutters with cam lock adapters. Made in two sizes for  $\frac{7}{8}$  and 1-in. diameter arbors. Quick change and positive drive are featured.

cede at a definite rate so that the taper is definitely controlled. While both the style TMM and the TM use insert chasers and cause these to recede as the taper thread is cut, the tapering action in the style TMM is caused to function by a yoke or fork on the machine, whereas in the latter, the tapering action is actuated by an inside plunger in contact with the end of the work.

#### Thread Plug Gage

*Detroit Tap & Tool Co.* has announced the addition of a line of thread plug gages made of wear-resisting "Crobalt." This is a non-ferrous alloy originally developed for cutting metals. Its high resistance to wear and abrasion has led to its adoption recently for numerous parts where elimination of wear is vital. The alloy is a cast material consisting basically of cobalt, chromium and tungsten. It may be brazed or welded to steel. An important advantage of the metal for gage work is its low thermal coefficient, reducing changes in gage size under varying temperatures to a minimum.

The new Crobalt thread plug gages are made to American Gage Design standards and will be furnished with aluminum hexagon handles when desired. Crobalt gages carried in stock range from a No. 8 machine screw size up to and including  $1\frac{1}{2}$  in. diameter. List prices of Crobalt Thread Plug Gages are 30 per cent above those for standard thread plug gages. Furthermore, the company has announced that it will re-purchase all scrap Crobalt thread plug gages at a price of \$1 per lb. in order to insure the return of scrap material.

#### Expansion Reamer

*Barber-Colman Co.*, Rockford, Ill., is now marketing the "Masterall" inserted-blade expansion reamer that is positively adjustable either larger or smaller to "tenths." Referring to the illustration, 1 is the reamer body in which the blades fit in milled slots; 2 is a spanner wrench used to turn

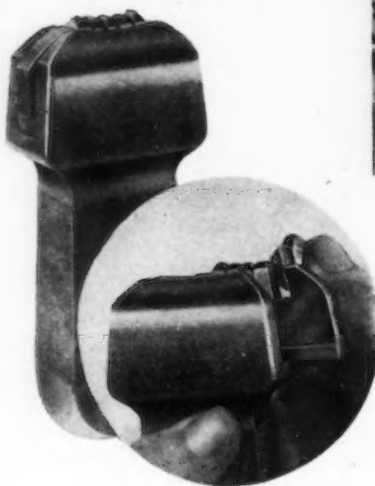
#### AT RIGHT

**THE** No. 824 Brown & Sharpe permanent magnet chuck is a new and larger size, with a working surface of  $8\frac{3}{8}$  by  $24\frac{7}{16}$  in.

o o o

#### BELOW

**THE** Cunningham safety wedge grip radius holder is a hand stamp suitable for marking pipe and bars.



tungsten carbide tipped milling cutters is announced by *Ex-Cell-O Corp.* in cooperation with the *Carboloy Co.*, Detroit. Reduced prices and a sliding scale of quantity prices have been adopted, and both companies will accept orders for cutter and replacement blades at standard prices. In addition, the standardization move will speed up deliveries.

The new Ex-Cell-O milling cutter incorporates the Continental type RC blade lock, selected for its simplicity of construction and adjustment and economy in operation. In this construction, tapered blades fit into tapered seats integral with the cutter body. Blades may be adjusted individually any desired amount, according to the grinding necessary on each blade, thus reducing grinding time and eliminating wastage of tungsten carbide in sharpening blades.

Blades are locked in place in pairs with an external clamp and an Allen setscrew. A light tap releases any blade from the cutter body. This construction also assures maximum heat conductivity through the provision of accurately fitting full-face blade seats, and security of blade lock without need for end stops.

#### Tool Holders

A new carbide tool holder made in straight shank or in right or left-hand offset patterns, in five sizes, has been added to the line of *J. H. Williams & Co.*, 75 Spring Street, New York. In these tools, the cutter is held parallel to the shank and it can be ground so as to provide maximum support to the cutting edge. These holders are

the adjusting collar (its tip fits a slot in the collar); 3 is the pinwedge blade lock containing a round leg that engages a limited groove in the body lock and a rectangular leg engaging a full length groove in the blade. The angular relationship of the two produces a wedging action when the wedge is pushed back by locking plate 5 when the wrench 4 actuates the hexagonal setscrew. The locking plate forces the blades against the bottom of the body slot, locking it securely in position. With the locking plate loosened, adjusting collar 8 can push forward the blades, which are then released by the wedges. The amount of expansion or contraction is controlled by the movement of this collar. Standard B-C reamer blades of high speed steel or Carboloy tipped can be used. Reamer body is of hardened alloy steel. Shell type reamers require an arbor with a tapped hole in the end to receive the locking screw. Chucking reamers come in sizes from  $13/16$  to 3 in., and the shell type, from  $1\frac{1}{2}$  to  $2\frac{1}{4}$  in.

#### Carbide Tipped Milling Cutters

Standardization with a view to lowering replacement blade costs on

broached for either square or flat standard carbide cutters, but are supplied without cutters.

*Williams* is also offering a new cutting-off tool holder, embodying the spring principle used in their threading tool. Due to the gooseneck design of this holder, the cutter blade is relieved of excess pressure. Chattering and climbing of the work on the



**A** SERIES of composite steel and brass strip adapter plates are available to hold small pieces on the new B & S permanent magnet chucks.



**"STAR"** and **"Victor"** hack saw blades now come packed in serviceable steel boxes—advantageous to both jobber and user.

tool, particularly on old or "loose" lathes, is said to be eliminated.

Both the new spring, and the older rigid types of *Williams'* cutting-off holders feature a positive cam cutter lock that grips the high speed steel cutter blade in such a manner that pressure of work against the blade tends to tighten it. The new spring cutting-off holders are supplied in both straight and right-hand offset patterns in four sizes.

#### Two-Jaw Chuck

A new two-jaw chuck that provides a greater degree of accuracy in chucking has recently been placed on the market by the *Cushman Chuck Co.*, Hartford, Conn. Features include a one-piece steel body, with hardened steel face in which the jaws are enclosed. This face plate is doweled to the body and further fastened by socket head screws. A center pilot

bushing extends through the body and seals the operating mechanism. The alloy steel operating screw is held by a self-aligning thrust bearing that completely encircles the neck and assures accurate alignment with the mating teeth of the master jaws. The jaws themselves have wide bearing surfaces to reduce inaccuracies due to wear. Furthermore the jaws are supported in the center, under the steel face, to prevent bell mousing.

Master jaws are of the American Standard design, and the soft top jaws, when attached, form a seal on the face, enclosing all working parts. This chuck is available in a full range of sizes for direct mounting to American Standard spindles, and can be

which holds the type. Individual slides and corresponding types are required for each radius desired. The slide is readily snapped open. The sides of the holder are knurled in order to give the operator a firm grip, and the head of the holder is of safety steel, which will not mushroom or spall in service.

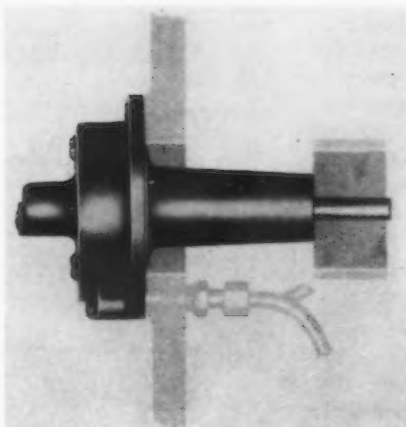
#### Permanent Magnet Chuck

A larger size chuck of the permanent magnet type is announced by the *Brown & Sharpe Mfg. Co.*, Providence, to supplement the line brought out last fall. The new size, designated as No. 824, has a working surface of  $8\frac{3}{8}$  by  $24\frac{7}{16}$  in. and is  $3\frac{3}{4}$  in. from the base. Like the smaller sizes, this chuck requires no electrical connections. A hand crank has "on" and "off" positions, effecting changes in the position of the permanent magnets in relation to the top plate so that the lines of force pass through the work or are short circuited through the top plate.

A series of adapter plates for holding small pieces are available for all three sizes of chucks. These plates are made of narrow steel strips or bars alternating with non-magnetic brass spacing strips. The magnetic flux from the chuck is conducted through the steel strips so that small pieces can be readily held. These

#### BELOW

**T**HE new Rollway rotary lubrication pump is shown mounted on the side of a machine, with inlet and outlet ports permanently connected.



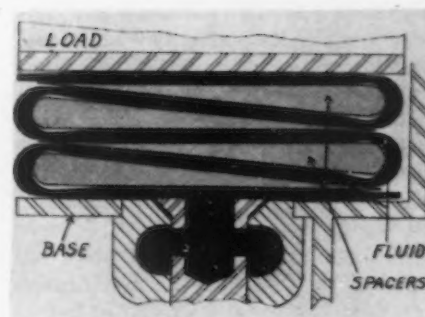
#### BELOW

**T**HE Linderman multi-stage diaphragm can be used to control brakes, clutches, holding fixtures and pressure regulators, either by air or hydraulic pressure.

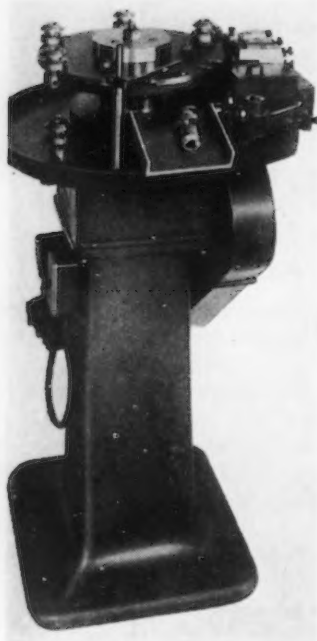
attached to the threaded type of spindle nose by means of an intermediate plate.

#### Stamp Type Holder

The *M. E. Cunningham Co.*, 101 E. Carson St., Pittsburgh, has introduced a new interchangeable type holder for stamping round or curved surfaces, such as pipe or shafts. The device, known as the safety wedge grip radius holder, contains a removable slide







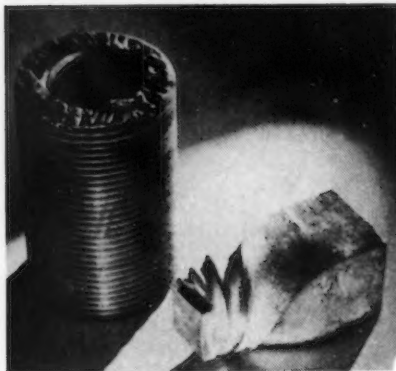
#### AT LEFT

**THIS** Noble & Westbrook marker with carrying and pressure dial was especially designed for marking chuck bodies ranging in size from  $\frac{3}{4}$  to  $2\frac{1}{2}$  in. in diameter.



#### BELOW

**THE** Reps pipe and stud extractor combines a square grip with a follow reamer. Heat treated to 490 Brinell.



plates come in lengths of  $7\frac{9}{32}$ ,  $7\frac{1}{2}$  and  $9\frac{9}{16}$  in. and in corresponding widths of  $3\frac{3}{4}$  and  $5\frac{1}{2}$  in. They are all  $\frac{23}{32}$  in. thick.

#### Hack Saw Container

"Star" and "Victor" hack saw blades, made by *Clemson Bros., Inc.*, and *Victor Saw Works, Inc.*, are now packaged in metal boxes with a double hinged lid and a double grip lock to insure easy opening and tight closing. They are strong but light and take up less room than cardboard boxes. On the bottom of each box is a chart to aid in the selection of the proper blade for various kinds of work. The boxes are lithographed in identifying colors for "moly" and tungsten blades. The new packaging offers advantages to both dealers and users of hack saw blades. *Continental Can Co.* is producing the boxes.

#### Lubrication Pump

A new Rollway machine pump that is said to hold its prime indefinitely has been announced by the *Pioneer Engineering & Mfg. Co.*, 31 Melbourne Avenue, Detroit. Its principal function is the lubrication of bearings, gears, multiple-spindle drill heads and similar units. Known as model ASE, it is a compact, positive displacement pump of the rotary type. All moving parts are of hardened steel, accurately ground. No gland is needed, as the driving gear is inside the machine. It is a high vacuum unit that delivers liquid immediately after rotation begins. The pump may be mounted on practically any flat surface of the ma-



**BONNEY** No. B18 heavy-duty diagonal cutting plier.



**WILLIAMS'** "Superior" carbon steel wrenches are said to be twice as strong as conventional carbon steel wrenches.



#### AT RIGHT

**BONNEY** No. T35 reversible ratchet wrench for  $\frac{3}{8}$ -in. square drive sockets.



chine assembly. As mounted against the outer surface, it may be connected or disconnected without disturbing either pipe lines or gears.

#### Multi-Stage Diaphragm

A method of converting static pressure into work or power is incorporated in multi-stage diaphragms now available from *Linderman Devices, Inc.*, New York. The device consists of a number of superimposed diaphragms interconnected so each expands the

same amount. Typical uses would be in operating such mechanisms as brakes, clutches (4 in. to 10 ft. diameter), holding fixtures, scales, lift jacks and for pressure regulators and damper adjusters.

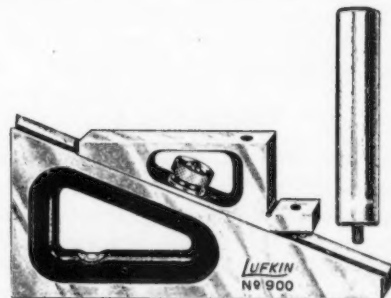
In operation, liquid or air pressure is admitted to the diaphragm. Total expansion or movement desired is regulated by varying the number of stages in the design. The device is particularly applicable in places where large total pressures for heavy duty service are desired from relatively low unit pressures, since the load is determined by the effective area of the composite unit selected. Thus it may be used for anything requiring a few pounds to many tons total pressure, with expansions ranging from 0.002 to 6 in. Number of pulsations may be specified up to 100 per min., the diaphragm design inherently supplying a quick release. Materials used are both ferrous and non-ferrous alloys.

The diaphragm up to this time has been used mainly in connection with the Linderman brake for trucks.

#### Pipe and Stud Extractor

A four-point grip pipe and stud extractor is announced by *Reps Tool, Inc.*, 220 Delaware Avenue, Buffalo. It combines a square grip with a reamer that automatically removes burrs from pipe, eliminating interference with the extractor's bite and minimizing expansion of the broken piece. The material is a heat-treated forged steel with a Brinell hardness of 490, greater than any material with which the tool will come in contact. The surface is cadmium plated.

Broken pieces of pipe are removed by inserting the extractor straight into the pipe so that all four points



**THE** Lufkin "Master" planer and shaper gage has a beveled slot to prevent side play in the slide when the clamp nut is tightened.

bite simultaneously. The tool is then turned by wrench in the direction of its threads. To remove studs or bolts, a shallow hole is first drilled in the center of the broken part. A set of 10 Repts extractors take care of pipe sizes from  $\frac{1}{8}$  to 2 in. and studs from  $\frac{5}{8}$  to  $3\frac{1}{2}$  in.

### Bonney Tools

Bonney Forge & Tool Works, Allentown, Pa., has announced a new reversible ratchet handle for  $\frac{3}{8}$ -in. square drive sockets and attachments, known as No. T35. It is light, strong and balanced. In order to keep out dirt and grease, the ratchet is fully enclosed. On one side is a  $\frac{3}{8}$ -in. lug and on the other is a  $\frac{1}{4}$ -in. square opening for use with  $\frac{1}{4}$ -in. adaptors or for use on small compressors, motors and shut-off valves. Made of Bonney chrome-vanadium steel, chromium plated and polished, it has a round knurled handle which insures a firm grip.

Bonney has also introduced a 15-in. reversible ratchet wrench, No. 4098, for use with  $\frac{1}{2}$ -in. square drive sockets. It can be quickly converted into a 10-in. type for close quarter work, by removing the extension. This tool is drop forged of "Zenel" steel, and is chrome plated.

Another Bonney development is the No. B18 heavy-duty diagonal cutting plier, drop forged and heat treated. The long cutting edges are carefully ground, and the tool is finished with a polished head and blued handles. A special analysis steel is used. Length is 7 in.

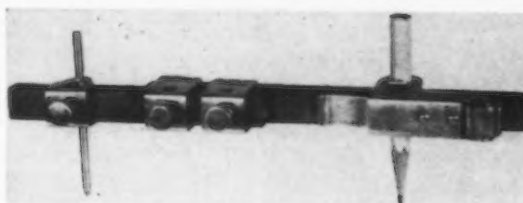
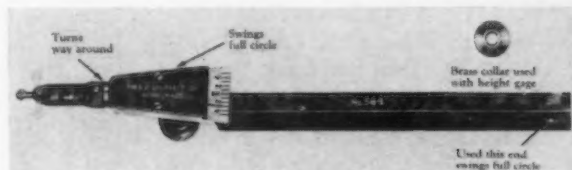


### Carbon Steel Wrenches

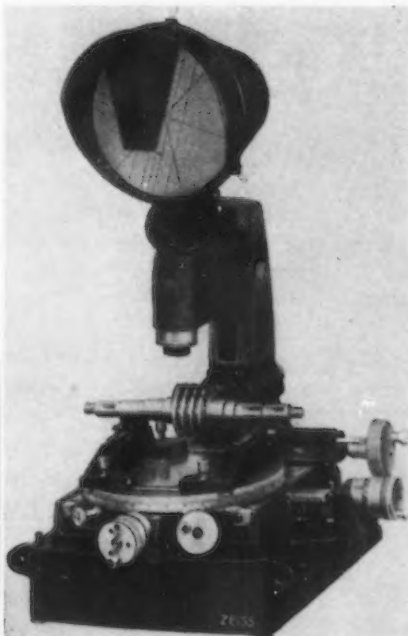
An improved type of carbon steel wrench is being supplied by J. H. Williams & Co., 75 Spring Street, New York, in a complete standard line consisting of 50 patterns and more than 1000 sizes. Drop forged from improved quality carbon steel and heat treated to exacting specifications, these

"Superior" wrenches are said to be twice as strong as old-fashioned carbon steel wrenches and average 93 per cent as strong as alloy steel wrenches of similar size. These improved wrenches cost no more than the old carbon steel wrenches and considerably less than alloy steel wrenches. Other advantages claimed

THE Starrett "Universal Junior" No. 564 indicator can be used in the tool post of a lathe or the indicator proper can be attached to the jaw of a height gage.



THE pencil or pen holder is adjusted along the beam by a knurled roller in this Bartusch "Perfect" beam compass.



ABOVE

A ROTARY, graduated table is found on the new large Zeiss toolmaker's microscope, with projector. Magnification, 10 to 50 times.

AT LEFT

IN the new Leitz profile projector, the contour of the part, laid on a horizontal stage, is magnified 10 to 100 times and compared with a scale drawing on the board.

are: better hand grip and greater and safer bearing on the nut.

### Profile Projectors

A new large toolmaker's microscope, with projector, has been announced by Carl Zeiss, Inc., 485 Fifth Avenue, New York. This measuring instrument has a rotary, graduated table with longitudinal travel of 6 in. and transverse travel of 2 in. and is provided with an inclined eyepiece for the convenience of the observer. It also has oculars with various contour templates that are readily interchangeable. Magnifications are 10, 15, 30 and 50 times.

Announcement is also made of a new Zeiss optical circular table, particularly suitable for indexing and dividing work of every description, especially in jig boring on large and heavy work. High accuracy is assured by the divided glass circle and reading microscope, without gearing.

Other Zeiss developments include an improved model of gear testing machine that furnishes an accurate analysis of individual gear errors by checking component elements, and an improved master camshaft tester for determining the form and angular relation of the lobes of cams of all kinds. Direct readings may be made on the glass master scale and spiral optical vernier to 0.00005 in.

(CONTINUED ON PAGE 117)



# The Characteristics of Industrial

## CHAPTER 29 of a Series on the Economics of Industrial Power Transmission Methods and Equipment.

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**A** CONSIDERATION of the arguments presented in the last discussion of this series (Fundamental Characteristics of Belt Drives, THE IRON AGE, March 17, 1938) clears the way for these general statements, adapted freely from the book "Pulley and Belt Transmission" as published by Rockwood Mfg. Co. from research data gathered at the Sibley School of Engineering, Cornell University:

The working element in a belt drive is the friction grip between the belt and the pulleys. This grip depends upon the pressure of the belt on the pulleys, on the coefficient of friction between the belt and the pulley surfaces, and on the arc of contact and the width of contact of the belt and pulley surfaces. To a certain degree, all belts creep backwards around the pulley without destroying the effectiveness of the friction grip. When that grip is no longer effective, for any reason, however, slip occurs, resulting in loss of driving efficiency.

The pressure of the belt on the pulleys is due to the tension in the belt, obtained by stretching the belt when putting it on, and by keeping it so stretched in operation. To maintain this tension it is necessary that the belt be of an elastic material, and that it be permanently elastic under the maximum tension to which it may be subjected in operation. If the tension is too high, the belt will stretch permanently and must be taken up frequently to prevent slipping. If it is too low, the friction grip is not maintained, the horsepower transmitted is reduced because of slippage, and efficiency is lowered.

In the transmission of power by belting, one side of the belt has necessarily a greater tension than the other; or, as it is said, one side is *tight* and the other *slack*. The difference between the tensions of the tight

and slack sides is the effective pull of the belt, and is equal to the total friction grip under operating conditions between the belt and pulley surfaces. It is therefore evident that, with a given tension in the belt, the power transmitted depends upon the friction grip between the belt and the pulleys, and that that combination of belt and pulley is the most effective in which the ratio of friction grip to belt pressure is the greatest.

Thus the two most essential elements of a belt drive are, (1) the coefficient of friction between belt and pulley surfaces, and (2) the effective tension in the belt. These are mutually dependent factors to a very large degree, but a thorough understanding of the subject requires a separate analysis of each. The frictional coefficient depends upon two factors, the material of the belt, and the material of the pulley. The subject of pulley surfaces and how they affect maximum friction grip will be treated in a later article of this series; here it will be assumed that the surface of any pulley considered is such as to present, with the belt being analyzed, the greatest possible coefficient of friction.

With regard to belt tension, belt drives may be classified under these three heads:

A. Those in which the weight of the belt alone is enough to produce an effective belt tension sufficient to transmit the power desired. Such drives are to be found in large, long center, heavy power installations.

B. Those in which the elastic properties of the belt are utilized to produce tension sufficient to transmit the power desired, the weight of the belt merely adding a small increment to this tension. This was by far the most common case until recent years, being found principally in medium size, medium center, moderate power installations.

C. Those in which the effective tension is produced by a mechanical automatic tension-adjusting device, such as a weighted idler pulley, a pivoted motor base, a varying diameter pul-

ley, or such a piece of equipment as the Wearn Autoflex. (These tension-adjusting devices will likewise be discussed in detail in a later article.) Such conditions are principally found in short center drives of any power, and latterly in medium center drives also, as the advantages of uniformly and automatically maintained belt tension under all conditions of operation become more widely appreciated.

With these general statements in mind, the following summary may be made:

The transmission of power by belt drive cannot be accomplished without belt creep, to which under certain circumstances must be added actual slip. Good operation will keep this down to somewhere around 1 to 1½ per cent of the belt speed. The actual limit is variable, and depends upon the quality of the belt and the alinement of the pulleys. A combined creep and slip of 1 per cent is always allowable for belt drives.

To confine the difference between the surface speeds of the driving and driven pulleys to this commercially allowable figure requires, however, in belts and pulleys of varying types and qualities, a decided difference in tension. It is in this respect that some belts and pulleys produce better results than others. For, if in any given belt drive a certain horsepower can be transmitted with a certain tension, and in a second belt drive of the same pulley and belt dimensions and the same speed the belt has to be two or three times as tight as in the first case to do the same work, evidently the first drive is the better. High tensions mean larger frictional losses in bearings and increased wear on the belt, resulting in lower total efficiency and decreased belt life. Or looking at it in another way, if the first drive were keyed up to the tension of the second, it would transmit more power than the second drive before the allowable slip limit is reached. It must be evident, therefore, that the economics of the situation boil down to a careful consideration of those belting characteristics which determine quality for any given application, and also



# Transmission Belting

By FRANCIS JURASCHEK  
Consulting Editor, *The Iron Age*

a careful consideration of what the application conditions call for in terms of belt quality.

## Belting Material Characteristics

Transmission belts are made of leather, of cotton, and of various rubber, gum, or oily compound-impregnated fabrics, as well as, rarely, of hair and metal. Transmission belts are made in two forms, flat belting and V-belting. Flat belting will be considered first, since it is as yet more widely used, and covers a wider range of belt manufacturing.

Leather is still the most widely used material for belting, in spite of the fact that leather is today only used for flat belting, while rubber, gum or compound impregnated fabrics are used for both flat and V-belting. (Leather has been used rarely for V-belts, and is still the accepted material for extremely light-powered round-belt applications, such as for sewing machine drives.)

In a "Treatise on Leather Belting"

issued in 1931 by Haven and Swett, both of Massachusetts Institute of Technology, the following is to be found: "Belting leather contains in an unusual degree a combination of all the qualities required in the transmission of power by belting. It has ample tensile strength, sufficient to give a large factor of safety under even extreme operating conditions. It has good frictional value, usually designated by the term 'friction coefficient.' This friction coefficient has the unique and distinctive factor of permanence. It actually increases with the first use of the belt. It also increases with the rate of slip. Leather is pliable, with the necessary elastic properties. It is one of the most durable materials ever made by man . . . in other words, it has a very long life." In this statement may be read those virtues which are essential to belt driving; tensile strength, pliability, elasticity, natural and ideal friction surface, and long life.

Minimum tensile strength for leather belting should be 3000 lb. per

sq. in. Average tensile strength taken throughout for single belts should be 3750 lb. per sq. in., and for double belts, 3500 lb. per sq. in. (Haven and Swett). The texture of leather over the backbone of the hide is compactly knit, while that nearer the belly is longer-fibered and loosely knit, with the result that center stock has greater lateral stiffness, will stretch less, and will retain its straight-running qualities better than the softer parts. Elasticity in a belt is that quality which causes a belt that is stretched to return to its original length when tension is released. A stretchy belt, when loaded or put under tension and released, remains permanently distended. Elasticity is desirable in belting, and stretching is a disadvantage. All belt leather must be stretched before it is made up into belting, but it should not be stretched to the point where it loses elasticity.

The coefficient of friction of leather belting most commonly used is 0.30. This, however, is only a fair average. As will be noted in the chapter on

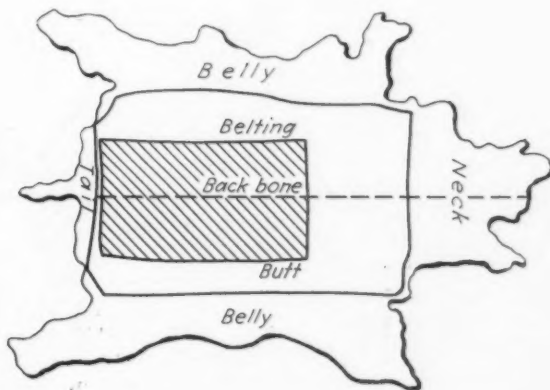


FIG. 1—Hide, belting butt, and first quality area (shaded). (Haven & Swett).

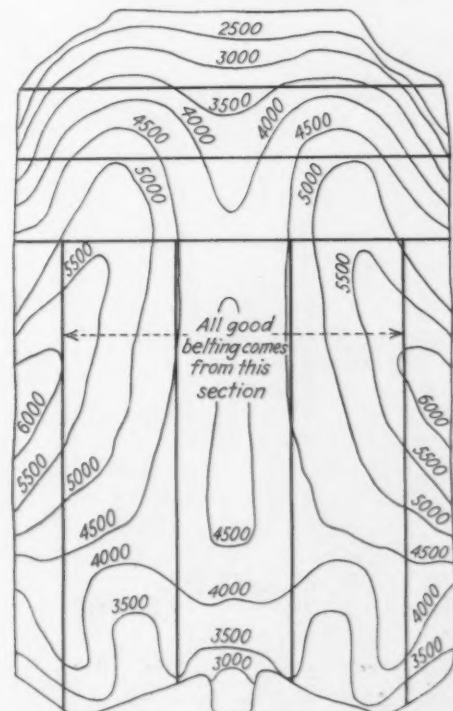


FIG. 2—Tensile strength of good quality belting butt in pounds per square inch. (Haven & Swett).

pulleys, it may vary in operation from 0.25 to 1.10, according to the tannage and other qualities. As to durability, the cases are legion in which a good leather belt, properly applied and maintained, has outlived the man who installed it.

### Leather Tannages

In general there are two types of leather belting, based on the method of tanning. Oak tannages are by far the most widely used; mineral tannages, or combinations of oak and mineral tannages, are almost entirely used for special operating conditions. Oak tanning makes a rather stiff leather, of low stretch characteristics, which, as belting, needs considerable breaking in. The coefficient of friction improves decidedly after the belt is thoroughly broken in. Oak tanned leather belting is best suited for the great majority of industrial uses, as it has firmness, pliability when worn in, permanent friction value, elasticity, good wearing qualities, a high degree of lateral stiffness, and long life. Mineral tanning makes a softer, spongier leather of high stretching qualities, slightly less ultimate tensile strength, and with a coefficient of friction the same when the belt is new as when well used. Both types have high salvage values after long use; oak probably more than mineral tanned belting. Oak belting should not be used in the presence of water, moisture, steam, high temperatures or mineral oil. Mineral tanned belts may be used under conditions of water, moisture, steam, temperatures up to 130 deg. F., acid fumes in not excessive quantities or mineral oil in not excessive quantities; or where belts of extreme flexibility are required. Both types are used in dry, dusty or gritty atmospheres and may be used where caustic fumes are present in not excessive quantities.

Combination oak and mineral tanned belts are available for situations requiring a combination of the desirable qualities of both types. They are made in four ways; by partially oak tanning the leather and finishing it by mineral tanning, by partially mineral tanning the leather and finishing it by oak tanning, by combining oak and mineral tanning together, and by fabricating the belt of strips of completely oak tanned and mineral tanned leather, in double thickness, with the flesh side of each strip back to back.

Leather belting may be made endless on the job or may be joined by lacing or with metallic fasteners. Oc-

casional dressing with animal oils or greases, particularly in dry or dusty atmospheres, may be required to keep the fibers of the belt well lubricated.

Regardless of the tannage, there must be good leather to start with, to make a good leather belt. Good belting leather is obtainable only from about 60 per cent of the hides of young steers; first quality belting leather comes from about 40 per cent of the hide, cut in strips parallel to the backbone, never across. Starting with good leather, properly tanned for the conditions of service, carried with animal greases to thoroughly lubricate the fibers (and sometimes with waxes to waterproof the surface), stretched and cut; belting is fabricated by joining "balanced" strips together with animal glue (or for waterproof belting, a pyroxylin cement). It is plain that many opportunities exist at many points along the line for inferior workmanship and the use of inferior materials. This is why the bane of the leather belting industry—price-cutting—has always been rife. The man who buys cheap leather belting gets just that and nothing more, for cheap leather belting cannot be produced without chiseling the quality somewhere. On the other hand, it is eternally true that first quality leather belting properly applied is, for a majority of industrial applications, the cheapest medium of transmission per horsepower year of use, no matter what its first cost may be. This statement will be amplified in a later article, "The Economic Problems of Belt Selection."

### Tentacular Belting

A special type of leather belting which has been used chiefly for short center work although designed for all types of transmission, is the so-called "tentacular," and is thus described by William Staniar in his *Mechanical Power Transmission Handbook*:

"It consists of a backing made from single or double ply leather or fabric, to the pulley side of which are attached, by means of special hollow

rivets, longitudinal strips of very soft, pliable, elastic, chrome tanned leather, possessing an extremely high coefficient of friction when in contact with pulleys. Rivets are embedded in the soft leather so that they will not come in contact with the pulleys.

"The friction strips are riveted every 2 in. and not cemented to the backing. This construction provides for independence of action between the two. The load is entirely carried by the backing, and the strips have no other function than to create a powerful adhesion between belt and pulley. Open spaces between strips eliminate the air film, which is a common cause of slippage with flat belting; it also adds to the transverse flexibility of the belt.

"It realizes a minimum of slip, with very little passive resistance to overcome when transmitting power. The inevitable power loss between the driving and driven pulleys is altogether less than 2 per cent, for an efficiency of over 98 per cent. This high efficiency is maintained regardless of the particular design of the drive; long, medium, or short centers; low or high pulley-diameter ratios; steady or fluctuating loads; etc. With pivoted motor bases, it makes an ideal combination, resulting in a very high efficiency.

"This type will operate on ordinary pulleys with a small crown. It is always best to use an endless belt; but when that is not possible, any of the usual belt fasteners may be used. Tentacular belting, whether of leather or fabric backing, may be made endless by the manufacturer."

### Rubber Belting

Flat rubber belting, sometimes known as "friction surface rubber," is made up of two or more plies of various weights of cotton duck, impregnated and frictioned with a tough, slow-aging rubber compound. As made today, rubber belting possesses high tensile strength, great flexibility, is durable; is water, moisture and

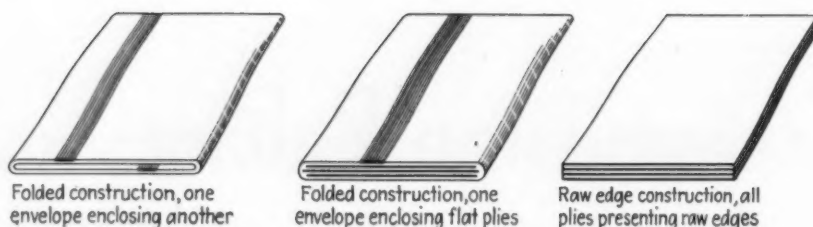


FIG. 3—Rubber belting, fabric construction. Folded construction, one envelope enclosing another. Folded construction, one envelope enclosing flat plies. Raw edge construction, all plies presenting raw edges.

steam proof, heat proof up to 130 deg. F., but is not resistant to corrosive acids, and deteriorates when subjected to excessive mineral oils. If, instead of rubber, certain new synthetic rubber compounds are used, it becomes highly resistive to excessive mineral oils. Friction coefficients approximate oak tanned leather, but not mineral tanned leather belting.

Three general types of flat rubber belting are in common use. (1) Folded construction consists of either one or more folded envelopes of duck encasing each other, or several flat plies covered with a folded envelope. Both

vage value, cord types have not. No belt dressing will penetrate to the internal fibers of a rubber belt. Such belting, however, should be dressed periodically with vegetable oils to soften the surface and keep it in a somewhat adhesive condition.

### Fabric Belting

Five widely used types are here described: stitched canvas, balata, solid-woven cotton, camel's hair and Teon; all except the last named being impregnated with various compounds to lubricate the fibers, protect the surfaces and increase the friction grip.

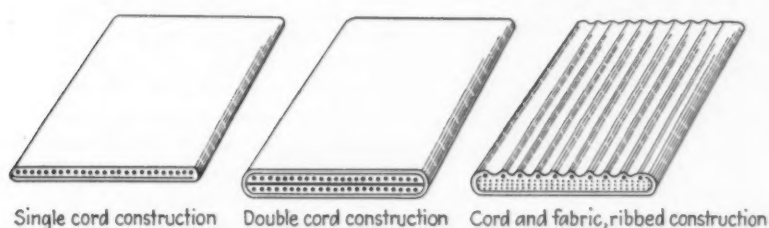


FIG. 4—Rubber belting, endless cord construction. Single cord construction. Double cord construction. Cord and fabric, ribbed construction.

give rounded belt edges. 2. Raw edge construction consists simply of two or more plies of duck laid flat on one another, resulting in raw belt edges. 3. Cord construction consists of rubberized cords laid parallel, longitudinally, surrounded with a rubber compound, and the whole encased in a folded fabric envelope.

"Compensated" construction is a variation of raw edge in which the plies are so laid as to compensate for longitudinal stretch, and the pulley contact surface is frictioned with a special compound. Fabric, cord and rubber are combined in various ways; usually with two sets of cords, one set few and heavy, and the other set many and light, both set in rubber and the whole encased in a folded envelope. All cord construction belting is made endless by the manufacturer; it cannot be spliced or joined on the job. Fabric rubber belting can be made endless by the manufacturer or on the job, or may be laced or joined with metal fasteners. Rubber belting has a high initial stretch. Once well stretched in service the properly applied good quality rubber belt retains a high degree of elasticity and should not slip. It is very flexible and may be used with small diameter pulleys. It costs less than first quality leather belting, but has not the same extreme length of life. Fabric types have sal-

Stitched canvas is composed of plies of cotton duck stitched together. The duck is cut and folded to the required belting size, stitched firmly together, and impregnated with compounds. After impregnation the excess compounds are squeezed out and the lengths of belting stretched. The round edge construction has the outer cover folded completely around the inner plies to form a lap on one side of the belt; the folded construction utilizes a folded lap on either side of the belt, leaving one edge raw for all sizes over four ply. Both types possess flexibility, elasticity and high resistance to ply separation, they cannot be made endless, but may be joined by lacing or metallic fasteners, and are resistive to water, moisture, steam, temperatures to 140 deg. F., and slight quantities of mineral oil. They should

not be used in the presence of corrosive acids. The better grades of these belts possess good resistance to slip and have frictional coefficients ranging from 0.25 to 0.60. Ultimate tensile strength is based on the number of plies and the weight of duck used; for 36-oz. duck a reasonable figure is 550-600 lb. per in. per ply. Belting of this type is not high in cost, but has not a very long life and possesses no salvage value.

Balata belting is made from tightly woven 36-38 oz. cotton duck, thoroughly impregnated with a gutta-percha-like gum known as "balata." This gum is very tough and waterproof, but will bond with nothing but itself, and cannot be vulcanized. The duck is first impregnated with the gum under heat and pressure, then cut and folded, and finally bonded together under great pressure, and stretched to a uniform tension. Balata belting does not stretch greatly, is tough, durable, and resists water, steam and moist atmospheres. Since balata gum melts at 120 deg. F., the belting should not be used in temperatures exceeding 105 deg. It is slightly resistive to the action of corrosive acid fumes, and has low resistance to the action of mineral oils. It may be made endless by the manufacturer, but not on the job. It may be joined by lacing or with metallic fasteners. It is considerably higher in cost than stitched canvas, and somewhat higher than rubber belting, but it has long life. It has no salvage value. No belt dressing will penetrate balata belting, but vegetable oil may be used to soften the pulley surface if it becomes dry and hard.

Solid-woven impregnated cotton belting is made from long-fiber cotton, woven solidly to form various thicknesses of belting fabric, thoroughly impregnated after weaving with special compounds. The belting is then dried, stretched and rolled to a uniform density, making a strong and durable material. Its friction coefficient varies from 0.40 to 0.60, it possesses high flexibility, is very elastic

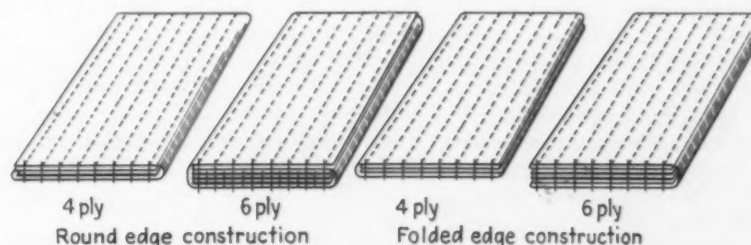


FIG. 5—Stitched canvas belting. 4 ply, 6 ply, round edge construction. 4 ply, 6 ply, folded edge construction.



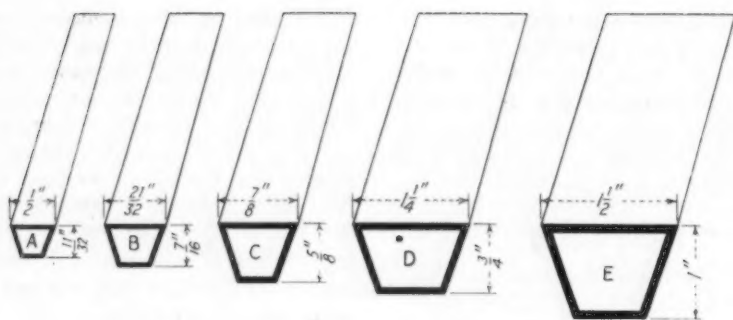


FIG. 6—Standard sections of rubber V-belts.

and will therefore absorb shocks well. It is moisture, water and steam proof, and will resist high temperatures. Alternate wet and dry conditions, however, will cause stretch and shrinkage. It resists the action of mineral oils unless the oil condition is excessive, and it is slightly resistive to corrosive acid fumes. It is highly resistant to dusty or gritty atmospheres and to alkaline chemicals. It is not generally made endless, but may be joined by lacing or metallic fasteners. It is about as costly as the better grades of rubber belting, has reasonably long life, but possesses no salvage value. These belts are dressed by their own impregnating compounds, which protect and lubricate the cotton fibers.

Camel's hair belting is likewise solidly woven, partly from the long hair of Bactrian camels and partly from long fibered cotton, under heavy tension; resulting in a solidly-woven one-piece fabric, uniform in thickness throughout its entire length. After weaving the fabric is thoroughly impregnated with heavy oils for lubrication and surface protection purposes, to prevent undue stretching and to add to the frictional qualities of the hair surface. It is then dried and stretched to proper tension. Camel's hair belting has a very high friction coefficient, ranging from 0.70 to 0.90, but an ultimate tensile strength of but 1/3 to 1/2 that of good quality leather belting. It requires no breaking in, has high elastic qualities and extreme flexibility, remaining soft and pliable throughout its life. It does not shrink, stretches but slightly after the high initial stretch, and has high shock-absorbing power. It is moisture, water and steam proof, resists temperatures up to 300 deg. F., is not affected by mineral oil unless the use is excessive, and will resist the action of the corrosive acid mists and vapors for long periods. It should not be used in the presence of caustic. It is high in price, has a reasonably long life, but possesses no salvage value. It is not made

endless, but may be joined by lacing or with metallic fasteners. The impregnating compounds form the belt's own dressing, as they preserve and lubricate the fabric. These compounds



FIG. 7—Construction of typical Rubber and Cord V-belt.

tend to dry out in use, however, and camel's hair belting should therefore be dressed periodically by special dressings furnished by the belt manufacturer.

Teon belting is of cotton duck ply construction, with the plies held together by a special cement, reinforced by metallic brads set in longitudinal rows, somewhat like stitching. It has a low coefficient of friction, low stretch, is moderately elastic, and is best suited to heavy slow-speed drives and vertical drives. It will resist moisture, water and steam; temperatures up to 300 deg. F., mineral oils if not in excess, and the action of corrosive acid fumes. It will not resist caustic, but is well suited to dusty or gritty atmospheres. It is quite costly for a belt of the fabric class, is fairly long-lived, and has no salvage value. No dressing compound will penetrate Teon belting; vegetable oils may be used if the pulley surface becomes dry or glazed.

#### V-Belting

It is not proposed to treat the V-belt drive problem in detail here, as it

warrants extended consideration separately. Sufficient to say that the design of V-belt drives was developed primarily to permit high ratios between the driving and driven pulleys to be used efficiently on short centers, where the arc of contact of a flat belt on the smaller pulley is too small to allow effective friction grip. Multiple V-belts have been applied successfully, however, to drives of moderate centers and all powers, also. The friction grip of a V-belt comes on the two inclined sides, not on the bottom. In fact, the bottom of a V-belt never touches the bottom of the sheave-groove; there is always an air-space between the two. The friction grip is increased by the wedging action of the belt between the two inclined sides of the groove; consequently the term "coefficient of friction" as used in flat belt practice is meaningless here.

V-belts were formerly made of leather. Few leather V-belts are now in use, and still fewer leather-link belts. Later, V-belts were made of fabric and rubber, but today are being made almost entirely of rubberized cord embedded in rubber, surrounded by fabric and rubber. Five somewhat different sections of V-belt are recognized as standard, and used according to the load, speed and other conditions which govern any particular drive design. They are made endless by the manufacturer, consequently it is imperative that a V-belt drive be provided with take-up facilities. In general the characteristics are similar to those listed for flat belt of cord, fabric and rubber construction. Ordinarily they are not resistant to excessive oil conditions, but if made with

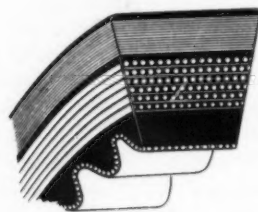


FIG. 8—The Dayton "Cog-Belt."

synthetic rubber compounds they are suitable for use under such conditions.

A special form of V-belt is the so-called "cog-belt" construction used by Dayton Rubber Mfg. Co., in which the under side of the belt is formed with a regular succession of transverse ridges. Performance characteristics of various types of V-belt will be discussed later.

# Current Metal Working Activity

Latest Data Assembled by THE IRON AGE from Recognized Sources.

	February 1938	January 1938	February 1937	Two Months 1937	Two Months 1938
<b>Steel Ingots: (gross tons)</b>					
Monthly output <sup>a</sup> .....	1,703,245	1,732,266	4,724,894	9,138,726	3,435,511
Average weekly output <sup>a</sup> .....	425,811	391,031	1,103,458	1,085,012	408,420
Per cent of capacity <sup>a</sup> .....	31.73	29.14	84.25	82.84	30.44
<b>Pig Iron: (gross tons)</b>					
Monthly output <sup>b</sup> .....	1,298,268	1,429,085	2,999,218	6,210,718	2,727,353
<b>Raw Materials:</b>					
Coke output <sup>c</sup> (net tons) .....	2,598,186	2,879,574	4,283,681	8,913,213	5,477,760
Lake ore consumed <sup>d</sup> (gross tons) .....	1,776,585	1,923,056	4,443,306	9,137,618	3,699,641
<b>Castings: (net tons)</b>					
Malleable, production <sup>e</sup> .....	18,689	18,575	57,295	110,933	37,264
Malleable, orders <sup>e</sup> .....	19,141	16,819	60,187	114,257	35,960
Steel, production <sup>e</sup> .....	.....	31,519	94,620	184,402	.....
Steel, orders <sup>e</sup> .....	.....	29,481	98,383	213,533	.....
<b>Finished Steel: (net tons)</b>					
Trackwork shipments <sup>a</sup> .....	3,014	3,135	8,153	15,399	6,149
Fabricated shape orders <sup>f</sup> .....	49,780	71,619	101,710	255,516	121,399
Fabricated shape shipments <sup>f</sup> .....	77,748	86,421	102,196	202,130	164,169
Fabricated plate orders <sup>f</sup> .....	17,792	23,422	32,375	73,794	41,214
U. S. Steel Corp. shipments <sup>g</sup> .....	474,723	518,322	1,133,724	2,283,642	993,045
Ohio River steel shipments <sup>h</sup> .....	74,612	73,250	88,170	184,570	147,862
<b>Fabricated Products:</b>					
Automobile production <sup>i</sup> .....	205,100	228,074	383,702	783,340	433,174
Construction contracts <sup>j</sup> .....	\$119,038†	\$195,472†	\$188,591†	\$431,435†	\$314,510†
Steel barrels shipped <sup>k</sup> .....	.....	.....	724,738	1,644,028	.....
Steel furniture shipments <sup>k</sup> .....	\$1,673†	\$1,980†	\$2,167†	\$4,437†	\$3,653†
Steel boiler orders <sup>k</sup> (sq. ft.) .....	435,197	501,603	862,093	1,516,252	936,800
Locomotives ordered <sup>k</sup> .....	17	9	33	79	26
Freight cars ordered <sup>k</sup> .....	109	25	10,532	21,413	109
Machine tool index <sup>l</sup> .....	75.7	118.4	165.2	207.7†	112.3†
Foundry equipment index <sup>m</sup> .....	90.4	76.8	249.5	241.2†	94.0†
<b>Non-Ferrous Metals: (net tons)</b>					
Lead shipments <sup>n</sup> .....	30,135	34,923	50,375	96,093	65,058
Lead stocks <sup>n</sup> .....	138,134	133,401	156,832	.....	.....
Zinc shipments <sup>n</sup> .....	21,540	24,931	46,953	98,180	46,471
Zinc stocks <sup>n</sup> .....	108,138	88,532	24,616	.....	.....
Tin deliveries <sup>n</sup> (gross tons) .....	4,420	5,550	7,675	15,290	9,970
Refined copper deliveries <sup>n</sup> .....	32,282	30,705	77,486	164,277	62,987
Refined copper stocks <sup>n</sup> .....	326,244	299,133	136,121	.....	.....
<b>Exports: (gross tons)</b>					
Total iron and steel <sup>r</sup> .....	460,640	586,102	290,985	492,679	1,046,934
All rolled steel <sup>r</sup> .....	144,379	188,032	115,335	225,655	332,412
Finished steel <sup>r</sup> .....	113,589	147,284	104,007	207,681	260,874
Scrap <sup>r</sup> .....	255,627	355,781	143,197	212,081	611,408
<b>Imports: (gross tons)</b>					
Total iron and steel <sup>r</sup> .....	19,589	29,631	40,720	83,791	49,220
Pig iron <sup>r</sup> .....	3,354	9,747	11,340	23,774	13,101
All rolled steel <sup>r</sup> .....	14,885	17,680	23,134	47,543	33,302
<b>British Production: (gross tons)</b>					
Pig iron <sup>s</sup> .....	693,300	761,100	603,700	1,254,400	1,454,400
Steel Ingots <sup>s</sup> .....	1,057,600	1,081,400	995,900	1,994,800	2,139,000

† Three months' average. ‡ 000 omitted.

Source of data: <sup>a</sup>American Iron and Steel Institute; <sup>b</sup>THE IRON AGE; <sup>c</sup>Bureau of Mines; <sup>d</sup>Lake Superior Iron Ore Association; <sup>e</sup>Bureau of the Census; <sup>f</sup>American Institute of Steel Construction; <sup>g</sup>United States Steel Corp.; <sup>h</sup>United States Engineer, Pittsburgh; <sup>i</sup>Preliminary figures from Automobile Manufacturers Association—Final figures from Bureau of the Census, U. S. and Canada; <sup>j</sup>F. W. Dodge Corp.—37 Eastern states; <sup>k</sup>Railway Age; <sup>l</sup>National Machine Tool Builders Association; <sup>m</sup>Foundry Equipment Manufacturers Association; <sup>n</sup>American Bureau of Metal Statistics; <sup>o</sup>American Zinc Institute, Inc.; <sup>p</sup>New York Commodity Exchange, Inc.; <sup>q</sup>Copper Institute; <sup>r</sup>Department of Commerce; <sup>s</sup>British Iron and Steel Federation.

## ... THIS WEEK ON THE

*... Automobile production and sales figures show small spring rise.*

o o o

*... Ford and Chrysler expected to increase assembly plant activity.*

o o o

*... Tool and die programs lag with deadline drawing near.*

o o o

*... Chrysler and UAW renew contract for year; strike at Plymouth forestalled.*

**D**ETROIT.—The automobile industry has recovered to a degree from its astounding plunge in retail sales. This is indicated by the dollar value index of the United States Department of Commerce and by recent production figures. Improvement in recent weeks has been quite perceptible; prospects are that production may shortly be increased substantially throughout the industry.

The dollar value index, with the level of 1929-31 equaling 100, had a value of 127.0 last October, but dropped to 89.78 and 65 in November, December and January respectively. Now the preliminary reports show the February index at 74. This is below even the 1935 level but is, nevertheless, a distinct improvement.

### **Assemblies Creep Up**

In the past week, assemblies in the United States and Canada totaled 57,500 units, according to Ward's Automotive Reports, compared with 56,900 the previous week and 97,710 a year ago. This increased production was attributed, for the most part, to Ford and Chrysler, both of which assembled more cars in the last week of March than in any recent week. The total Ford output, including Lincoln-

Zephyr, was 14,385, compared with 12,560 the week before last. Plymouth, reflecting happily the rising volume of retail sales, turned out 7500 cars, compared with 6250 the previous week. The Plymouth plant, incidentally, worked approximately four and one-half days last week, increasing about a half day over its former schedule. Chrysler as a whole produced 14,575 compared with 13,325, while General Motors slid to 25,030 from 23,160. Chevrolet maintained an output of 16,000.

A sign of better health is the report from Ward's service that a survey of field stocks indicates fewer cars now in the hands of dealers than on April 1 in either 1937 or 1936. In view of this, it is anticipated that good sales reports for the current week will result in stepping up production throughout the industry. Plymouth has a fine possibility of operating a full five days this week, the success of its spring selling campaign, with emphasis on its lower priced Roadking models, being largely responsible for this. However, the fact that last week Chrysler was threatened by a "stop work" strike may be partly responsible for the Chrysler Corp.'s determination to boost production while it could do so unhampered by labor troubles.

Despite gloomy stories circulated in

Detroit about Ford Motor Co. shutting down its plants because of a reported over-supply of cars, there is every reason to believe that the assembly of Ford cars and trucks will be increased quite sharply this week. Early in the month, an important Ford spokesman said that, beginning immediately, every Ford branch assembly plant would be in operation at a stepped-up pace.

The closing down rumor about Ford had a little foundation, it is true. About 20,000 men were laid off between March 25 and April 1 at the River Rouge plant. Only 23,000, about one-quarter of the usual force, are now working there. This means that Ford's production of parts and sub-assemblies is being readjusted downward. Since last fall Ford has been building up tremendous inventories and the company is now at the stage of letting its assembly work at branch plants cut down its inventory of parts and materials. For instance, the Ford steel mill has not operated at all since March 25. This is an indication that Ford's need for materials is just as dormant as its need for additional parts and sub-assemblies.

### **Spring Pickup Slow To Start**

The spring pick-up has been slow to start and has only been proportionate to the regular seasonal movement, not at all equal to the degree of activity normally experienced. In other words, in the spring the public's fancy turns to buying new automobiles and won't be entirely denied, but fear of the future has kept sales at about 50 per cent of the normal level. For instance, latest registration totals show that the industry in January and February sold about 250,000 cars, compared with 450,000 in the same period a year ago. Sales in recent weeks have had about the same percentage relationship to those of last spring.

Students of the automotive situation seem agreed that the industry probably will be at very low ebb during the summer months. Shutdowns



# ASSEMBLY LINE . . . .

By W. F. SHERMAN  
Detroit Editor

for the model changeovers probably will be longer than ordinarily experienced. Opinions of a majority of automobile men agree that real recovery will not be experienced before next fall's introduction of new cars.

After a spurt of activity in connection with the new models, Detroit has settled down again to a period of waiting. With the notable exceptions of Ford, Buick and Nash, there has been no important tool or die activity to date. Releases on new jobs have come so slowly that some sources now express the belief that meeting the November 11 Auto Show date will be difficult. It is possible that there may be more hand made models on the floor than production models.

## Chrysler Labor Dispute Settled

Underneath the swift maneuvering of Chrysler Corp. and the UAW last week it is possible to read the tale of some important labor activity. Chrysler acted quickly last Thursday to forestall what it believed was an incipient "stop work" strike in the Plymouth plant. Ostensibly the strike was to have been an attempt on the part of the UAW to force the corporation to hire more people. More likely than not it involved the negotiations for renewal of the UAW contract which began March 14 and, until March 31, had produced no definite results.

In the negotiations, the union is understood to have insisted on an arbitration clause to provide a method of settlement when management and union officials find themselves deadlocked. The union also demanded that the corporation promise not to reduce wages during the next year. As late as Wednesday, March 30, the union put these two demands up to the corporation as ultimatums. Chrysler regarded accession on these points as releasing the union from its contract obligations not to strike. It refused to consider the points during the negotiations and finally won. An announcement was issued Thursday

night that the entire "Lansing agreement," fostered a year ago by Governor Frank Murphy, would be in effect another year. Machinery for the ratification of this pact by Chrysler local unions was put into motion immediately, since each of the plant groups must approve it.

The management's method of forestalling the "stop work" strike which it feared, consisted of posting a notice in the early hours Thursday morning on all the plant bulletin boards. It said in part:

### "TO THE EMPLOYEES OF CHRYSLER CORP.:

"The management of Chrysler Corp. was informed today that plans are being made for a 'stop work' strike in the Plymouth Plant on Thursday or Friday.

"We are told that the plan is to wait until everybody is at his usual place and then to stop work, letting the conveyors and other machinery keep right on operating.

"This would of course require the management to stop the lines.

"We are also told that this 'stop work' strike is to be an attempt to force the corporation to hire more people."

The notice continued with the company's explanation that production was not sufficient to warrant rehiring men and added, "We make this information public so that the employees may know what it is all about if a 'stop work' strike occurs." The second page of the notice was a summary of the contract negotiations as they stood on the morning of March 31.

## Unions More Aggressive

UAW activity in General Motors plants is by no means at a standstill and union officials are making certain that no manufacturer gains the impression that the UAW has died because of the recession. Members of the union employed at General Motors Ternstedt division voted last Friday night against any share-the-work pro-

gram which would reduce employment of the working force below 24 hr. a week. At this meeting, Walter Reuther, president of the West Side Local of the UAW, lectured the union members on this subject of maintaining the union's effectiveness. Referring to a strike at the Federal Screw Works in Detroit, he said, "The Federal Screw strike is a trial balloon sent up by the General Motors and other big corporations which want to know exactly what the UAW is going to do about it." The Federal Screw Works plant was the scene of a riot last Wednesday in which 13 policemen and a score of pickets were injured.

Other evidence of renewed union aggressiveness came Friday when employees seized control of the largest power plant and four substations of the Consumers Power Co. At Zilwaukee, the steam power plant that serves Saginaw, Bay City, Flint, Pontiac and 125 other eastern Michigan communities, the union men gained control, ousted the superintendent, but maintained power service rather than turning it off as they had done in two previous strikes last May and June.

Within a few hours after taking possession at Zilwaukee, they seized two distribution stations near Flint and substations at Saginaw and Bay City. The decision to strike came after the union committee walked out of a negotiations conference in Jackson, Mich., when the company refused to enter a one-year wage agreement which would peg wages at the current level. This, the company said, it could not do because of an injunction which grew out of a three-way union controversy a few weeks ago with CIO, AFL and an independent group. All are demanding recognition. The independent union has obtained an order restricting the company from signing a CIO contract.

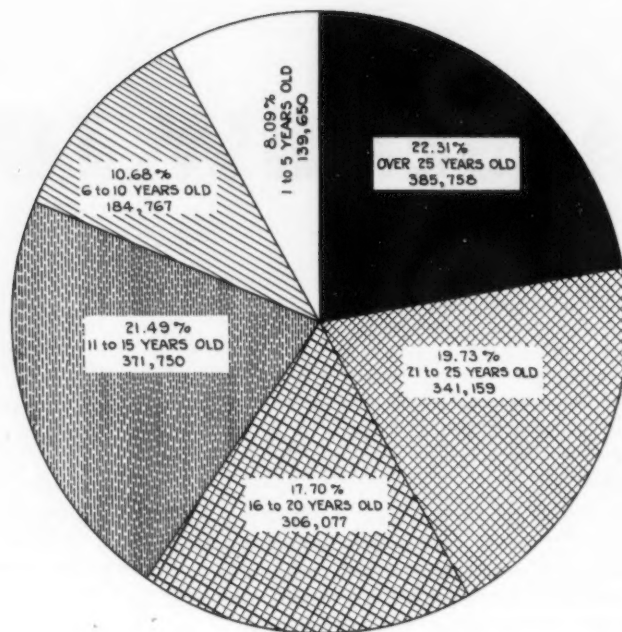
Governor Murphy, in Florida at the time of the strike, started immediately back to Detroit to take part in settling it. An agreement was signed Monday night after an all-day conference.

## Railroads' Bad Order Cars Are Increasing

THE ultimate need of extensive repair and rebuilding and purchase of new freight cars by the railroads is borne out by recent figures showing the increase in the number of bad order cars. While the problem is not a serious one for the railroads so long as carloadings are not heavy, a return of normal traffic volume will undoubtedly be accompanied by heavy car repairs and new purchases.

As of March 1, last, the Class I railroads reported 201,643 bad order cars, or 11.9 per cent of the total number of cars owned by the railroads. Cars owned by private companies are not included in this calculation. The largest number of bad order cars ever reported by the railroads was about 15 per cent of the total number owned. The normal volume of bad order cars is 6 per cent. Thus it will be seen that the present curtailment of repair

AGE of freight carrying cars in the United States, Class I Railroads, January 1, 1938.



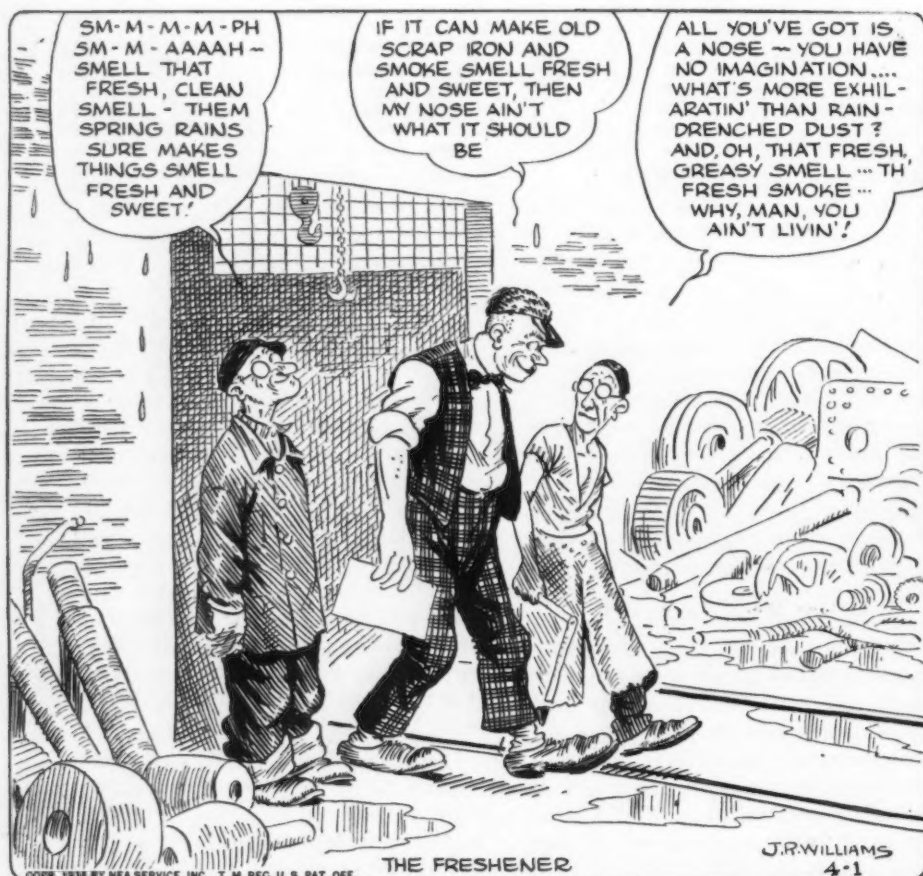
programs by the railroads is gradually building up a large number of cars to be rebuilt or scrapped in favor of new equipment.

The American Railway Car Insti-

tute, 19 Rector Street, New York, has recently prepared a chart showing the age of freight cars in the United States, as of Jan. 1, 1938. This chart shows that 22.31 per cent, or 385,758 cars, were more than 25 years old at the beginning of this year, while only 8.09 per cent, or 139,650 cars, were less than five years old. The total number of cars owned on January 1 was 1,729,361.

## OUT OUR WAY

BY J. R. WILLIAMS



## Bethlehem, U. S. Steel In Mining Congress Exhibit

UNITED STATES STEEL CORP. and Bethlehem Steel Co., with many machinery and equipment manufacturers, will display improvements to the \$3,500,000,000 coal industry at the American Mining Congress convention in Cincinnati, May 2-6. The gathering is expected to develop sizable equipment orders from coal operators. It is estimated that normally the annual purchases of coal mine equipment and supplies aggregate \$150,000,000.

The United States Steel exhibit will show the central cross section of a coal mine in which the essential uses of steel are displayed, such as steel rail and mine tie applications, clips, bolts, electrical wire and mine cars.

Bethlehem Steel Co. will show an all-steel mine car with hydraulic brakes, forged steel wheels, armored ties, switches and wire rope.

## Index Slightly Higher at the End of March



THE IRON AGE Weekly Index of Capital Goods Activity

(1925-27 = 100)

	Week Ended Apr. 2	Week Ended Mar. 26	Comparable Week	
			1937	1929
Steel ingot production .....	45.9	43.5	117.5	122.2
Automobile production .....	49.6	50.4	83.2	126.2
Construction contracts .....	72.1	72.9	63.3	149.8
Forest products carloadings .....	49.6	47.9	68.7	131.9
Production and shipments, Pittsburgh District .....	53.4	52.6	113.2	117.7
Combined index .....	54.1	53.5	89.2	129.6

THE rate of production and distribution of capital goods in March was slightly higher at the close of the month than at the opening, although the average for the period was a little below the February level, according to THE IRON AGE seasonally adjusted index. The first week of March saw the index at 52.8, then aided chiefly by gains in the rate of steel production and in the volume of heavy construction awards, the index hesitantly advanced to 54.1 in the last week of the month. Contra-seasonal declines in automobile production and in carloadings of lumber products were responsible for the minor setback experienced by the index in the week ended March 26 when the composite figure receded 0.4 points. It is interesting to note that during the entire month the movements of the index were limited to within a range of 1.3 points, as compared with a range in February of 3.0 points, in January of 2.4 points and in November, 1937, of 13.0 points.

The weighted average index for March is 53.5, as compared with 54.9 in February and 92.1 in March, 1937. In 1934 the March average was 60.2, while in 1933, the nadir of the recession, the March average was 28.4. The average index for the first quarter of the current year is 54.7 against 91.2 in 1937 and 56.6 in 1934.

For the week ended April 2, the index advanced 0.7 points to 54.1 per cent of the base years, chiefly on the basis of the greater-than-seasonal improvements in the rate of steel production and in carloadings of lumber products. Automobile assemblies failed to gain in keeping with the seasonal trend and the index position of this component dropped 0.8 points. A sharp shrinkage in the week's volume of heavy engineering awards forced the construction series downward, leaving this index at 72.1, as compared with 72.9 in the previous week.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from Engineering News-Record.



# THIS WEEK IN WASHINGTON

*... Business decline slowly but irresistibly severs ties binding President with various groups of organized labor since New Deal rose to power.*

o o o

*... New Government purchasing policy requiring quotations at f.o.b. mill in cement business strikes at basing point system for steel, other industries.*

o o o

*... Congressional approval of measure making \$1,500,000,000 available to industry for long term loans forestalls more inflationary legislation.*

o o o

By L. W. MOFFETT

Resident Washington Editor  
The Iron Age

o o o

WASHINGTON.—The current business recession was seen last week relentlessly driving a wedge between the apparently inextricable ties which have bound organized labor and the Administration ever since the New Deal first came into power.

Aside from the natural effects of a depression, such as increased unemployment, curtailed organizing drives and dwindling financial resources

which always accompany thinning pay envelopes, the Administration is believed to have widened the rift.

One factor pointing in this direction was the Presidential reference to what he described as the Senate's failure to be "purchased" in the vote on the Administration's reorganization bill when that body approved the measure by a narrow margin. Of all the groups waging a vigorous battle in opposition to the bill, the AFL was one of the most active and was reported to have been responsible for a substantial portion of the telegrams which flooded Capitol Hill urging defeat of the measure. Hence, for the President to say that the Senate could not be "purchased" was for him to infer that the AFL and other opposing groups were attempting "the purchasing." AFL chieftains were reported to have bitterly resented the statement as did members of both Houses.

## Wagner "Purchased?"

Senator Robert F. Wagner, always an Administration stalwart, even voted against the measure, thus placing himself in line for the Presidential stigma of having been "purchased."

CIO Chairman John L. Lewis, who has carried a poorly concealed chip on his shoulder ever since Mr. Roosevelt's "plague o' both your houses" statement of last summer following the Steel Mediation Board's unsuccessful effort to end the steel strike, now openly criticizes the Administration for failing to stop the downward business spiral. He says the country is "moving in economic reverse."

"The Federal Congress," Generalissimo Lewis says, "lacking adequate or competent leadership and in continuous session for months past, has failed to devise or enact a single statute that would cause a glimmer of hope to penetrate the mist of millions of despairing Americans."

## Conflict Over Price Policy

Another factor which has weaned the CIO forces away from the Administration is the President's apparent move a few months ago to force down steel prices at a time when the SWOC forces were ready to negotiate for wage contract renewals. Coupled to that feeling is the continuing conviction in AFL circles that the Labor Board's CIO bias is maintaining its status quo and is attributable, at least in part, to the New Deal's weakness in filling key administrative posts with individuals disqualified or unsuited to the jobs.

Because these factors portend a growing lack of confidence within labor circles, observers are watching trends closely in an effort to measure their significance in terms of a possible realignment of political strength in 1940.

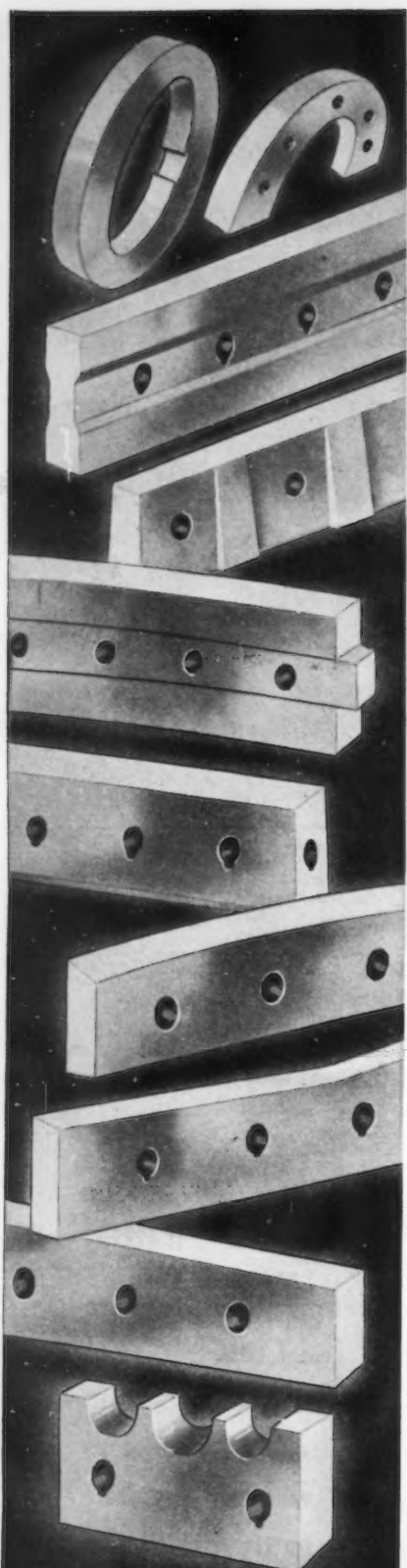


# SAVE THE RESETTING TIME

It takes time to move a roll out of grinding position, true the wheel, and readjust the roll to the wheel. The CINCINNATI roll grinder eliminates all this resetting, because the hydraulic wheel truing attachment is built into the wheel guard. The wheel may be trued whenever necessary and without disturbing the set-up, giving the operator more time to devote to the actual grinding operation. This truing attachment is a small feature in a machine of this size, but it's an important one. Catalog G-383 explains all the features of the CINCINNATI 20", 24", and 28" Roll Grinder. Write for your copy. The Cincinnati Milling Machine Co., Cincinnati Grinders Incorporated, Cincinnati, Ohio, U. S. A.



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## New Government Buying Plan Seen as Basing Point Threat

**W**ASHINGTON.—Broad attack on the basing point system for the iron and steel and all other industries which employ it is seen in a new and sweeping Government purchasing policy ordered by President Roosevelt, effective April 1. By means of this policy it is evidently hoped by the Administration to accomplish by a short cut what has been sought through Federal Trade Commission investigations and proposed legislation.

The order, announced last Thursday by Secretary of the Treasury Morgenthau, immediately strikes at the cement industry by requiring that bidders on material for Government work quote on the basis of delivery at the place of manufacture—f.o.b. mill. But it was tacitly if not openly admitted that the order looks to the breaking down of the basing point system in all industries which use it.

The point has been raised that the Government hardly could attempt abolition of that system and substitution of an f.o.b. mill system in one industry without directing a like policy to other industries which quote on a delivered price basis. While the Federal Trade Commission itself may issue, as it has done, a cease and desist order affecting only a single industry or a section of a single industry, it is clear that the intent of such an FTC order is to make it effective for an entire industry either through voluntary action or by further legal steps to other industries using like methods.

### Move May Affect All

Just at present the FTC is engaged in an extensive case directed against the basing point system used by the cement industry. It also has issued a complaint against cast iron pipe makers in connection with the Birmingham-plus system of quoting prices.

It is plain that these drives, if successful, would be expected to apply to the basing point system in all industries, again by either voluntary action or by further legal proceedings. The objective of the FTC is to force a universal f.o.b. mill basis of quotation. Legislation to this end has been proposed but for the present lies inactive, an outstanding example being the anti-basing point bill of Senator Wheeler.

After extensive hearings the bill was not reported out, apparently because evidence submitted by steel and other affected interests convinced the majority of the committee of the unsoundness of the measure, which was strongly supported by the Federal Trade Commission. It is said that if the recent Treasury order does not serve its purpose that such legislation may again be urged, possibly by the Administration this time. It is not expected, however, that any action will be sought at the present session of Congress, though the forthcoming Presidential anti-trust message may deal with the subject.

### Seen As Trial Balloon

Quite conceivably it will be not only designed to further tighten anti-trust laws, but to meet challenges of the authority of executive orders, possibly including the order of the Treasury Department which makes the Procurement Division the purchasing agent for supplies on all contracts, direct and indirect, financed either partially or wholly with federal funds, and which as an immediate objective would compel quotation of cement prices on an f.o.b. mill basis.

Authority to compel such quotation is questioned and may be expected to face a test when on April 15, the Procurement Division will take bids on cement. Some view the order as a trial balloon with the cement industry selected for the first test and are convinced that if it proves successful obviously the order will be extended to other industries using the basing point system.

It can be a much swifter maneuver against the basing point system than that which can be launched by the FTC. The latter can move only by a gradual process, covering either sections of an industry or an entire industry only, while the Treasury Department order embraces a comprehensive Government purchasing policy, which it seems clear, cannot apply to one industry alone but must, if discrimination is to be avoided, apply equally to all industries.

There is circumspection reflected in Government circles concerning the matter but definitely the implication:



given is that the policy would pertain to all purchases. Moreover, the order has further breadth. For it proposes to make the Procurement Division the purchasing agency for all supplies required in connection with contracts involving Federal funds. This would mean a profound change in policy since supplies for such outstanding Government branches as the Navy and War Departments, have always been purchased direct by these important departments which have heretofore zealously maintained their independent purchasing policies. It has been suggested that if their policies are now to be surrendered to the Procurement Division, as some Government officials have said will be the case, denials to the contrary, sharp differences may develop. Aside from the Navy and War Departments, the Procurement Division now acts as the purchasing source for all Federal purchases involving substantial sums.

#### Backwash of Conflicts

Secretary Morgenthau's order is a backwash of conflicts between Government officials, notably Secretary of the Interior Harold L. Ickes and industries bidding on Government business. Beginning almost with the inception of the present Federal Administration, one principal source of sharp difference has been so-called identical bidding for which the basing point system was held responsible. All sorts of charges and attacks were made against the practice, with emphasis on an allegation of "collusion." So aroused did Ickes become over some Public Works Administration bids that he induced the President to institute an FTC investigation and a Department of Justice study. The Justice report conceded that the department could not prove collusion merely on the basis of "identical bidding," but did recommend revision of the anti-trust laws, a task that is said to have just been completed by Assistant Attorney General Thurman W. Arnold of the Anti-Trust Division who took over the job from his predecessor, Robert H. Jackson, when the latter was made Solicitor General. The FTC price study also is said to be virtually completed. It was ordered by the President who asked that inquiry be made into so-called "monopolistic" practices and their bearing on rising prices. Many industries, food, clothing, lumber, steel, etc., are said to have been included in the FTC investigation. Material from the Department of Justice and the FTC reports is expected to form the chief basis for the President's forthcoming anti-trust message to Congress.



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better, faster, for less... with  
a Warner & Swasey.*

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SWASEY**  
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## RFC Credit Bill Blocks Measure By Left-Wingers

WASHINGTON.—Restoration of RFC's emergency credit facilities to make \$1,500,000,000 in "unused funds" available for long-term loans to industry and public agencies as provided in the Glass-Steagall measure was approved by Congress in record time, forestalling efforts to push for passage of a more liberal bill urged by Congressional left wingers.

The legislation, which removes the 1945 time limit on repayment of RFC loans and also the limitation of \$300,000,000 on the total amount of money

available, was described by RFC Chairman Jones, who supported the move, as answering a demand for industrial loans which the banks are unable to make.

Mr. Jones' appearance before the Senate Banking Committee came concurrently with a report by the Federal Reserve Board that loans to business had declined in the week ended March 23 for the sixth consecutive week. Banks in 101 leading cities, according to the board, reported commercial, industrial and agricultural loans dropped \$29,000,000 below the previous week.

### Banks Can't Take Chance

"The banks are full of money and want to make loans," Jones told the

committee. "But they should not make loans on which they might have to foreclose."

Asked by Senator Townsend, Republican, of Maryland, if he believed the Government should make that kind of a loan, the RFC chairman answered affirmatively.

"I think," he said, "that in a situation like this the Government can afford to take a chance when the banks can't. . . . We have proved that we can make these loans and get the money back."

He described the legislation as offering the chance to "anybody, anywhere, if you've got a legitimate right to borrow money for 5 or 10 years, come and get it."

### Only One That Has Made Money

Senator Carter Glass, Democrat, of Virginia, sponsor of the measure which had also received Administration approval, gave similar testimony in the Senate. He said:

"This particular matter is confined to the RFC because of all the Government agencies in Washington it is the only one that has made money, and if the authority to make loans to small-business men and small industries is not left open we are to have soon a bill that will ruin the credit of this country."

The Virginian did not disclose the identity of sponsors of such a measure but expressed the view that "it would be a very ruinous bill." He said passage of his measure would "avert that disaster."



Do You, Too...?  
Like To Read  
Other People's Mail

Then take a look at this:

A letter received March 23, 1938, from a consulting engineer specializing in mechanical and industrial design reads:

"I have had quite a bit of satisfactory experience in plants with your pumps and will appreciate copies of these bulletins:

1. Set of bulletins covering . . . centrifugal pumps.
2. Bulletin No. 167 covering reciprocating pumps.
3. Bulletins covering complete line of valves.
4. Data, installation drawing . . . mixing nozzles.
5. Bulletins of physical and chemical data for your various alloys."

And then he asks questions about the handling of specific corrosive liquors.

So, of course, we brought him up-to-date on Duriron Company Products.

Maybe you, too, have a hankering for some nice, fresh bulletins on acid handling equipment—such as pumps, valves, pipe, heat exchangers, steam jets, and metal alloys for corrosion-resisting equipment.

Doesn't take much to get them—just drop us a note.

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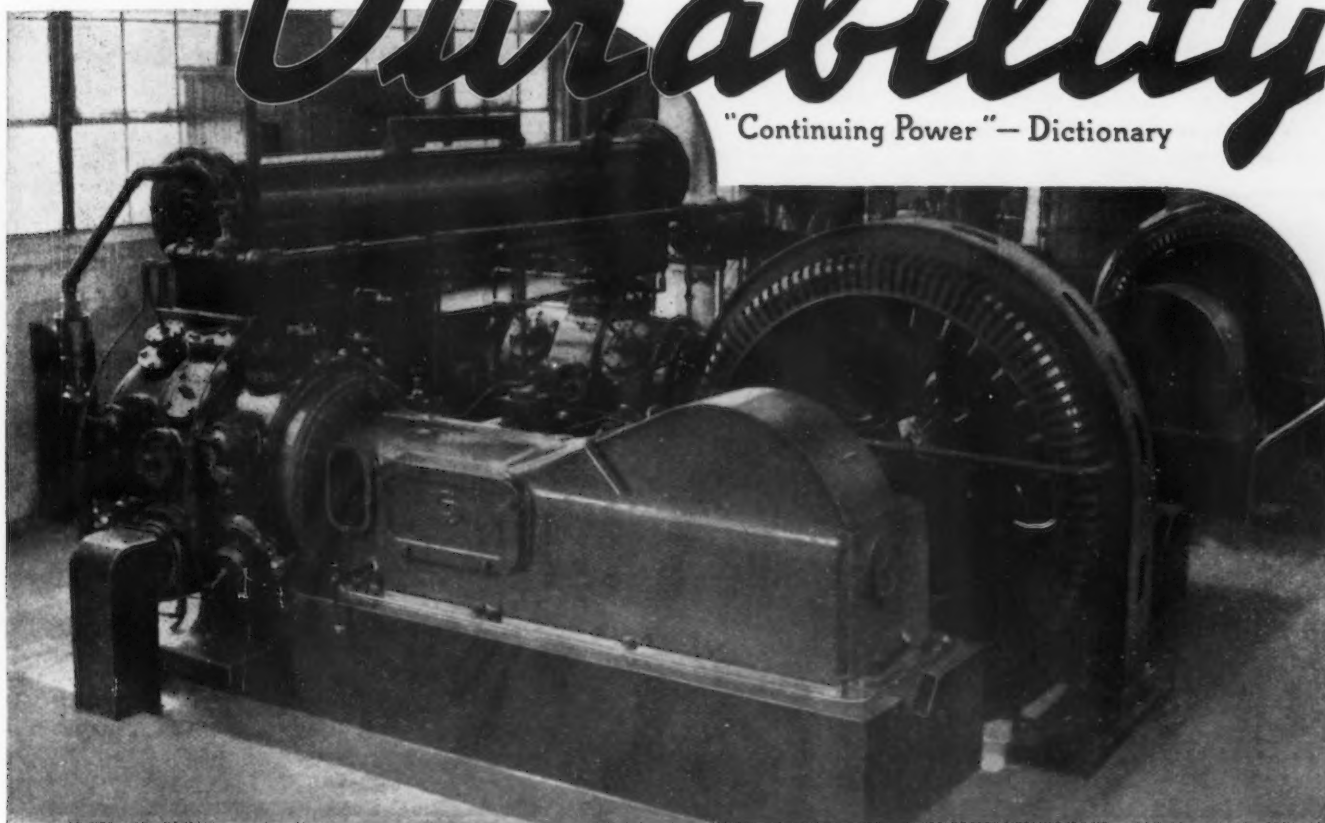
## 70-Car Train Bill Loses in House Vote

WASHINGTON.—Vigorously opposed by the railroads and strongly supported by railroad labor, the bill to limit the length of freight trains to 70 cars was defeated, 14 to 7, by a House Interstate and Foreign Commerce Committee vote in refusing to report the bill to the House. The bill had previously passed the Senate. The House committee action sounded the death knell of the measure at least for the present session of Congress. Railroad executives had estimated that enactment of the bill would increase costs by \$125,000,000 annually.

Industrial Engineers have a word for it:

# Durability

"Continuing Power"—Dictionary



In a prominent pipe foundry and machine shop, the "Continuing Power" of the CP Air Compressor in the background resulted in a "repeat" order for the duplicate machine in front.

Engineers in all industrial fields have seen CP Air Compressors stand up, year after year, with sustained high efficiency, under heavy-duty, 24-hour continuous service. They recognize this "continuing power" as characteristic of CP Air Compressors . . . and time after time, reward it with that most significant of all endorsements . . . the "repeat" order.

Simple Valves, efficient regulation, properly designed air passages, accurate machine work, reliable lubrication, etc., all combine to achieve the outstanding durability of CP Air Compressors. All are described in illustrated bulletins . . . gladly sent on request.

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## COMPRESSORS



## 3000 Newly Hired By Remington-Rand Fight Displacement

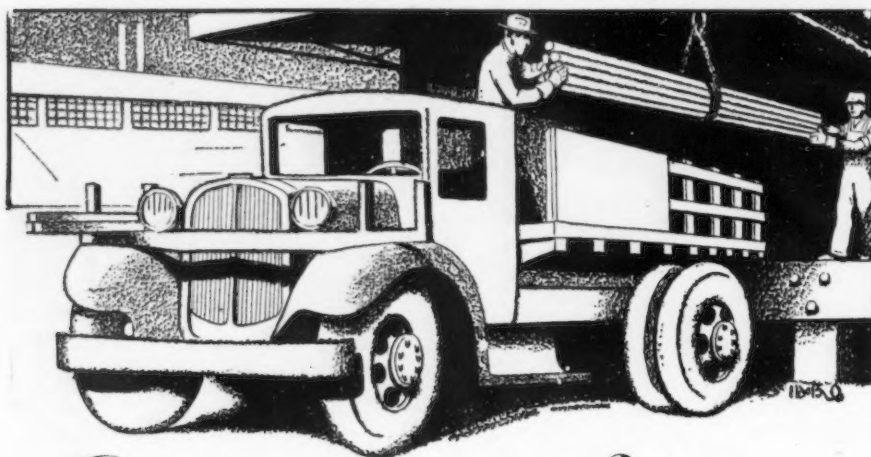
WASHINGTON.—The latest Wagner Act twist to harass the Administration is the puzzle of how to rehire 3000 former AFL workers at Remington-Rand's Buffalo, N. Y., plant without dismissing 3000 successors who have held jobs since an AFL strike in 1936.

The NLRB has ruled that the company must reinstate the 3000 employees who were not rehired after the strike but the present employees have protested, wiring President Roosevelt that they took their jobs in good faith and ought to receive the Government's help in untangling the controversy.

"Now by order of the NLRB, we are about to be ordered out of these jobs and reduced to the position of 'that lower third' which you are so diligently trying to help," Elmer Peter-

son, Remington-Rand employee committee member, said in a telegram to the President.

Mr. Roosevelt, explaining he was not familiar with the case, ordered the telegram referred to the Department of Labor.



## Emergency Service—

COLD drawn steel requirements cannot always be anticipated. Occasionally there are *rush* orders. Warehouse stocks of regular cold drawn steels in standard sizes and shapes are carried in all important manufacturing centers. Emergency service—rush order service—is at your elbow—The Telephone.

**Moltrup Steel Products Co.**  
Beaver Falls, Pa.

(Pittsburgh District)

## Blaw-Knox Avoids Loss in February

WILLIAM P. WITHEROW, president, Blaw-Knox Co., Blawnox, Pa., reports "orders are being booked in about the same proportion as the rate of activity in the various fields which the company serves. In spite of the low rate of activity in some consuming industries," he said, "the company was able to operate without a loss in January and February. The past influence of the undistributed profits tax has made it inadvisable and practically impossible to adopt a long-range dividend policy and until conditions indicate definite improvement in general economic situation, the directors deemed it in the best interest of the company to defer dividend action."

Directors of Blaw-Knox at their annual organization meeting held in Pittsburgh, March 28, took no action on an interim dividend. Present officers were re-elected.

## Navy Buys 11,500 Tons of Ferromanganese

WASHINGTON.—The Navy Department has announced awards for 11,500 tons of 78-80 per cent ferromanganese which will be stocked at the Philadelphia Navy Yard. To E. J. Lavino & Co., Philadelphia, was awarded 6000 tons at \$110.50 a ton, while 5500 tons went to the Colorado Fuel & Iron Co. at \$105 a ton, f.o.b., Minnequaha, Col.

## 300th Union Barge Tow Leaves Pittsburgh

PITTSBURGH.—More than 150 executives of leading Pittsburgh industrial organizations and their sons attended a celebration here last week marking the 300th tow of the Union Barge Line Corp. to leave Pittsburgh for Memphis and other southern points. The guests were entertained on the Union Barge Line's all-steel diesel tow boat *Peace* which left for Memphis on April 1 with barges carrying over 6000 tons of products of this district.

## Soviet Purchases in United States In 1937 Totaled \$75,000,000

**S**OVIET RUSSIA'S purchases in the United States in 1937 reached a total of \$75,000,000, according to a statement issued by D. A. Rosoff, chairman of the board of the Amtorg Trading Corp., 261 Fifth Avenue, New York. This was the largest volume purchased in one year since 1930, it was stated, and compared with total purchases amounting to \$35,000,000 in 1936. The 1937 figure refers to orders placed in the United States against which all shipments have not been completed.

Orders were placed with 1033 companies in the United States last year, Mr. Rosoff said. Among the important commodities bought were machine tools, steel sheets and strip, tin plate, presses and forging equipment, rolling mill equipment, aviation equipment, non-ferrous metals, radio and television equipment, electrical apparatus, oil well and refinery equipment, internal combustion engines and chemical equipment.

"The prospects for Soviet-American trade for 1938," said Mr. Rosoff, "will be largely determined by the opportunities created for a mutually advantageous exchange of goods and services. Competitive prices, favorable delivery terms, suitable technical and commercial arrangements, as well as favorable conditions for Soviet exports, are some of the essential conditions for the further expansion of Soviet-American trade.

"Although the Soviet Union is now in a position to carry out its economic plans, if need be, independently of foreign commerce, it does not favor a policy of autarchy, and has repeatedly expressed its readiness to develop its foreign trade as a factor in the strengthening of international good will and cooperation among nations."

Mr. Rosoff's statement throws some light on recent developments in connection with American sales. Heretofore sales of steel have been made entirely for cash against shipping documents in New York. Now some steel companies have received word direct from Moscow that a good deal of the business henceforth will be negotiated from Moscow rather than through the Amtorg Trading Corp. and that credit terms will be required on at least a part of such sales.

With reference to direct trading between American concerns and Moscow, Mr. Rosoff's statement declares that more than 45 per cent of all trading between companies in the United States and the Russian organizations last year was done with Mos-

cow. He says: "An increasing number of American manufacturers are sending representatives to Moscow and otherwise establishing direct contacts with the major business organizations of the Soviet Union. The opportunity to discuss on the spot the merits of their products with the technical staffs of the Soviet organizations enabled American concerns to increase their own business, and at the same time to contribute toward the extension of Soviet-American trade in general."



### ***This Tiger Scale Crane Weighs and Loads with Speed***

In this up-to-the-minute shipping room of a large glass plant they weigh and load plate glass quickly and at one operation by means of this easy-running, all-roller-bearing, scale-equipped Tiger crane (one of 10 in the plant). Outgoing shipments are handled with the greatest possible dispatch and complete safety because the crane operator has full control of every move. And you can't beat a Tiger for low operating cost.

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## Armament Program Now Chief Support of British Steel Industry

**L**ONDON (By Mail).—An early resumption of activity in the British pig iron trade is probable in view of the prospective increase in consumption caused by an extension of the Government's rearmament program, as outlined by Premier Chamberlain recently. So far, however, there has been no trace of the usual seasonal resumption of buying. Supplies of pig are now ample for all purposes and surplus tonnage is going into stock.

In connection with the acceleration of rearmament, it is being suggested

in some quarters that the Government should take steps to create a reserve of pig iron against an emergency.

The new trade agreement just concluded between Britain and Italy should lead to a revival of the pig iron trade with the latter country. Everything will depend, however, on the removal of differences experienced under the old clearing arrangements, which resulted in payment being held up in many instances for several months. Formerly substantial tonnages of pig iron were exported from Tees-side ports to Italy, but during

the past year a certain amount of business has been declined, partly due to the scarcity of supplies—now overcome—and partly due to the difficulties of exchange.

### Armament Shops at Full Pressure

Heavy steel products now constitute the most active section of the British trade and mills are working on good orders which will provide steady employment for some time. This applies especially to Sheffield, where steps have been taken to facilitate output still further. The armament shops are working at full pressure, as also are the steel foundries.

Alexander Williamson, general manager of Steel, Peech & Tozer, one of the United Steel combine, speaking at Rotherham recently, said that the most recent record made at the company's works was set up for the first week of March, when the ingot output reached 15,247 tons—the biggest individual ingot output ever achieved by any firm in the United Kingdom.

### Lull in Lighter Steels

The lighter steels are experiencing a lull. Some leading manufacturers report a contraction of orders from the automobile and radio industries. As a result, at some Sheffield works supplies of billets are being taken into stock for the first time for many months.

The first concern to take advantage of the position created by the large accumulation of stocks, through extensive importation by consumers of foreign material during recent months, to close down its blast and steel furnaces for reconditioning and modernizing is the Brymbo Steel Co. Repair and replacement of plant is being carried out during the current lull in order that the firm may be able to deal more effectively with its business on a return to normal conditions. This decision involves the temporary discharge of 650 men. Half of the sheet plant was closed down at the beginning of March.



Speed, action—and a high grade job—are offered by Hi-Tensile "G". The smoothness of the bead is surprising, its ductility unusually high.

Hi-Tensile "G" has easy handling qualities—as well as speed and quietness. Perfectly suited to in-

dustrial production, to maintenance work, to construction work—and to the odds and ends of jobs that reach the average welding shop.

Get in touch with your local Page distributor. He has some information you should have.

**PAGE STEEL AND WIRE DIVISION  
AMERICAN CHAIN & CABLE COMPANY, Inc.  
MONESSEN, PENNSYLVANIA**

*In Business for Your Safety*



**PAGE** *Welding* **WIRE**

### SWOC Leads in Vote at Wickwire-Spencer Plant

**B**UFFALO. — John L. Lewis' SWOC received 412 votes against 354 for the Federation Industrial Union when Wickwire-Spencer Steel Co. employees here chose an exclusive bargaining agent in a Labor Board supervised election.



GENERAL ELECTRIC ANNOUNCES  
*Brighter MAZDA lamps*

# NEW LOW PRICES



**SIGHT SAVING SIZES  
REDUCED AS MUCH AS 25%**  
*The 19th Major Price Cut in 17 Years  
Effective April 1st, 1938*

SIZE	WAS	NOW
75 WATT.....	<del>20¢</del>	15¢
100 WATT.....	<del>20¢</del>	15¢
150 WATT.....	<del>25¢</del>	20¢
50-100-150 WATT...	<del>50¢</del>	45¢
100-200-300 WATT.	<del>65¢</del>	60¢
200 WATT.....	<del>35¢</del>	30¢
300 WATT*	<del>60¢</del>	50¢
500 WATT (Clear) ..	<del>\$1.40</del>	\$1.20
*Clear, medium base.		
<b>Silvered Bowl Lamps</b>		
100 WATT.....	<del>60¢</del>	55¢
150 WATT.....	<del>70¢</del>	65¢
200 WATT.....	<del>85¢</del>	85¢
300 WATT.....	<del>\$1.45</del>	\$1.35
500 WATT.....	<del>\$2.25</del>	\$2.05
<b>Daylight Lamps</b>		
100 WATT*	<del>35¢</del>	30¢
150 WATT.....	<del>50¢</del>	45¢
200 WATT.....	<del>80¢</del>	75¢
300 WATT.....	<del>\$1.20</del>	\$1.15
500 WATT.....	<del>\$2.15</del>	\$1.95
*Inside frosted.		

Space does not permit the listing of all the types and sizes of lamps made by G-E. Many other lamps are also affected by this latest price reduction, including lamps for streets, highways, trains, locomotives, and street cars.

*"They stay brighter longer!"*

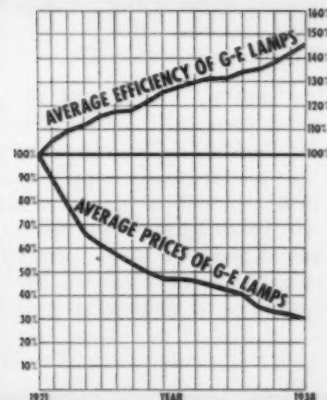
## Better light for shops, offices, factories

On April 1st General Electric announces a double saving for every shop, office, or factory that wants better light for better sight: *First*, new brighter MAZDA lamps that stay brighter longer and give more light than ever before. *Second*, General Electric's 19th major price reduction in 17 years. New low prices on sight-saving sizes used in the home, stores, offices, factories, schools, and transportation.

These new, brighter MAZDA lamps and

new low prices offer you great advantages toward bringing lighting standards up to the modern requirements for efficient, safe seeing. They make your lighting costs lower than ever.

Because of this continued policy of offering better and better MAZDA lamps at lower and lower prices, it pays to insist that the lamps you buy carry the famous G-E monogram on every bulb. General Electric Company, Nela Park, Cleveland, Ohio.



General Electric research and development are constantly at work to increase the light output of MAZDA lamps and to reduce prices. The above chart shows graphically what has been accomplished since 1921. Average bulb prices are down 70% . . . while average efficiency has climbed 40% in the same short time.

**GENERAL  ELECTRIC**

## 1937 Record Year for Armco in Sales, Employment and Profits

**A**ERICAN ROLLING MILL CO. and its subsidiaries set new records in 1937 for sales, employment, payrolls and earnings, George M. Verity, chairman, and Charles R. Hook, president, said in their annual report to stockholders.

Armco's total of employees reached

18,473 in July, 1937, wage rates rose 47 per cent above the levels of 1929 and the company's 1937 sales were \$114,857,600 compared with \$101,463,383 in 1936. The Armco report said:

**ON LABOR**—"We have operated on the theory that if the men under-

stood the limitations of management, and management understood the objectives of the men, there would be continuing harmony and the best interests of both would be served."

**ON TAXES**—"We are gravely concerned with the growing burden of taxation and unless drastic steps are taken to reduce all governmental expenditures, the tax bill will continue to mount."

**ON EXPANSION**—"In 1937 Armco increased its holdings in Rustless Iron & Steel Corp., Baltimore, to approximately 47 per cent of the common stock of that company and, with John Lysaght Co., Ltd., of England, plans to organize Commonwealth Rolling Mills, Ltd., for production of specialty iron and steel sheets in Australia."

**ON RECOVERY**—"There is in this country a dormant purchasing and investing power which, if given the proper incentives, could start the wheels of industry turning again at a healthy rate which would mean help for all of our people. Your management believes that this dormant power will be released, in the march of events, as confidence and certainty as to the future are restored."

**ON EARNINGS**—"Net profits for 1937 were \$8,231,335 against \$6,441,677 for 1936."



... specializes in giving you cold rolled strip when you want it, where you want it, and how you want it. Executive, sales, and engineering departments are all located AT THE MILL, thereby making possible a quick, sure, personalized answer to your cold strip problems. All departments are coordinated to constantly check deliveries, gauge, temper, and finishes, in order that you may have the protection of Thomastrip uniformity.

In addition to meeting all specifications promptly, and accurately, The Thomas Steel Company produces electro finishes in zinc, copper, nickel, and brass, as well as uncoated bright finish. Investigate the possibility of using one of these finishes . . . investigate the advantages of a service that specializes in your cold strip requirements.



### Japan Is Producing More Stainless Steel

**TOKYO (By Mail).**—As the result of the sharp increase in the consumption of copper and bronze in the munitions industries, civilian circles are being attracted to stainless chrome steels. The Naoetsu rolling plant of the Japan Stainless Co., planning to cater to this new market, has recently added to its equipment a large four-stage Krupp rolling mill and another three-stage machine. Attention is also being attached to the fact that the orders for this equipment were not placed with American firms, but went to Germany, although United States rolling machinery has virtually held a monopoly in the Japanese steel industry.

**Pittsburgh Screw & Bolt Corp.,** Pittsburgh, reports net profit for the year 1937 after surtax, of \$1,252,698, equal to 83c. a share, compared with \$1,046,350, or 70c. a share in 1936. Sales in 1937 increased 11.36 per cent in tonnage and 29.91 per cent in dollar value. Inventories declined from \$2,403,383 to \$2,216,370.

**THE THOMAS STEEL COMPANY • Warren, Ohio**

SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

# Ten Years of Steel

• • •  
By Myron C. Taylor  
• • •

**EDITOR'S NOTE.** When Myron C. Taylor retired April 4 as United States Steel Corp.'s chairman, he said "the Steel Corporation of today is not the Corporation of 1928."

Neither is the America of today the America of ten years ago. Both the nation and United States Steel Corp. are discussed in the following article by Mr. Taylor, "Ten Years of Steel." The article will appear in full in THE IRON AGE in installments of which the following is the first.

• • •

**L**OOKING backward over the decade, it will make for a clearer view of those many things that have been happening in the Steel Corporation if we consider the nature of the years and the nature of the Corporation.

The Corporation is much more than a commercial enterprise. It is a national institution and its pulse throbs with that of the nation. And so it cannot be successfully managed solely and restrictedly as a commercial enterprise. But, at the same time, it is a private institution, in that it must stand on its own feet. It has the three-fold obligation of keeping its policies in consonance with the public interest and with the interest of the more than 200,000 men and women whose savings have been entrusted to it and with the interest of the 250,000 employees who depend upon the Corporation for a living.

• • •

## **Its Philosophy Unchanged**

Throughout the ten years, the Corporation has had a philosophy and a

plan. It has not been necessary to change the philosophy. Indeed it could not be changed, for it was not founded on expediency. It was founded on the simple verities of life—and they do not change. The plan, from time to time, has had to be changed and details of its execution postponed, because the Corporation must furnish its own motive power and therefore it could not go faster than the prudent use of its resources permitted. Thus it has taken ten years to do what I had hoped we could do in five years.

These have been turbulent years, and no man yet knows the full significance or the permanency of the social changes that have come about. My administration began with almost two years of booming business. This ended with the stock market break of Oct. 29, 1929. Then began the depression, which, as it deepened, so changed the mode of men's thoughts that ever since as a nation we have been depression-minded. The depression ran its course and reached its



depth in 1932, since which time we as a nation have been fitfully regaining a measure of economic health. We have not been as a nation self-supporting since 1931—which is the year the Federal deficits began. Therefore it has been impossible at any time to say, and it is now impossible to say, how much of the business of the Corporation has been derived from the normal needs of the people in the course of their daily production and how much has been derived from the direct spending and the relief spending of the Government.

#### **Tried A New System**

The country has gone from the gold standard to a managed currency standard, and the full effects of that change are still obscure. For nearly two years the country tried out a new business system under the National Industrial Recovery Act. While industrial production and the whole of distribution were trying to find their bearings under the NRA, the methods of agricultural enterprise were profoundly changed by the Agricultural Adjustment Act. For a time, the nation operated under a new economy that reached after a substitute for competition. That period had social consequences which are still with us and which find expression in the Guffey Coal Act, the Robinson-Patman Act, the Miller-Tydings Act and other statutes.

**H**EAVER taxes, as well as new forms of taxes, have altered both the cost and the budget factors of doing business. The consequences of these taxes, including the charges imposed by the Society Security Act, are too complex for definite appraisal at this time. Under the Wagner Act, the relations between employer and employee have been placed upon a new but as yet indefinite footing which has occupied both sides of the human work equation. There have been many strikes. Wars and the threats of wars, revolutions and the threats of revolutions have disturbed and continue to disturb the world, which has further been clouded in several great nations by the rise or the development of the concept of the state as the supreme overlord of economic life.

The changes brought about in the economy of our country by legislative acts have been very great and important. They have presented one set of problems. The financial exigencies of the depression have presented another set. The changes in the operating rate of the Corporation will give an indication of the financial problems.

In 1928 the Corporation operated at 83.4 per cent of finished steel capacity; in 1929 at 89.2 per cent; in 1930 at 65.6 per cent; in 1931 at 38 per cent; in 1932 at 18.3 per cent; in 1933 at 28.7 per cent; in 1934 at 31.2 per cent; in 1935 at 38.8 per cent; in 1936 at 59.3 per cent; in 1937 the high, which came in April, was 90.9 per cent and the low, which came in December, was 30.2 per cent, the average for the year being 71.2 per cent.

#### **A Consumption Economy**

Such fluctuations as these are beyond the power of man to cope with. But, while the total steel consumption was rapidly sinking, it was also changing its character. The country moved from a capital goods economy to a consumption economy. This change probably derives from the fact that a nation which is not earning its living requires only such capital goods as are needed for replacement and in the day-to-day production of consumption goods. That is a shift which in the nature of things cannot be permanent, but it vitally affected the Corporation because its capacity, having been designed for the kind of demand that existed prior to 1929, stretched over both capital and consumption goods, with the emphasis on capital goods.

While this revolution in the habits of the people was taking place, the steel industry itself went through what amounted to a revolution in the introduction of continuous rolling mills for the production of flat hot and cold rolled products, and these products began to assume first place in the industry, once it was discovered that they amounted to new products that could be put to new uses.

Into an unsettled industry which, on the whole, was losing money there came an almost instant demand for the laying out of great sums to meet the revolution in the science of steel making which transformed it almost over night from a rough industry into a precision industry. The Corporation had to meet the challenge.

**I** HAVE taken it as a part of my duty as a trustee working for the ultimate good of the army of stockholders and workers who together compose the Corporation to arrange, to the best of my ability, for cooperation between the Corporation and whatever national administration happened to be in power. The lines of interest of the Corporation considered as a whole and of the public considered as a whole must run parallel—for the Corporation cannot exist ex-

cept as it serves the public. Those are not mere words. They express a fundamental truth and I think that this truth is more widely accepted today than at any time in the history of the Corporation. I can say this with an entire objectiveness.

#### **Attuned to National Policies**

During the NRA period, which extended over about two years, a good deal of my time was necessarily spent in Washington, with my associates, and through the 10 years of my service my visits to Washington have been frequent—not as an individual but as the chief executive of the Corporation. My mission has not been to seek any special advantages for the Corporation nor merely to keep the Corporation within the law, but to attune the policies of the Corporation to the national policies as part of the Corporation's obligation of citizenship.

The other obligations—the obligations to those who own the Corporation and to those who work for it—have been met by an almost complete internal reorganization of the Corporation. The Steel Corporation of today is not the Steel Corporation of 1928. Its financial economy has been made over, its directing personnel and the manner of its direction have been made over, and its physical properties have been so largely made over, that, of the production in 1937, scarcely one-quarter was of the same composition or made in the same fashion as the production of 1928.

During this period of deep industrial unrest, which has seen more strikes than any previous period in the nation's history, the Corporation has had only one strike worthy of mention, and that was of a minor and purely local character. This was the strike in the so-called captive mines in 1933. It was more a contest to gain control of a labor union than a strike against the Corporation. Its settlement gave the opportunity to formulate a labor policy which has met all of the subsequent situations and has not merely avoided the occasion for labor disputes, but has also worked positively to bring about an exceptionally fine and mutually self-respecting relation between the Corporation and its employees.

#### **Changes in Management**

Since this is the accounting of a 10-year stewardship, it seems proper at this point and before going into a more detailed description of what has occurred, to note, that, while I accept the responsibility for everything that

has happened during the 10 years, I was not charged with the responsibility during the entirety of the period. Judge Elbert H. Gary, at the time of his death in 1927, was the chief executive officer of the Corporation, as well as chairman of the board and chairman of the finance committee. It did not seem wise to the board of directors to continue the concentration of these several offices in one person, especially since at that time I cherished the hope of being able to complete the reorganization of the Corporation and retire within five years. Under the new arrangement, I became chairman of the finance committee in December, 1927, and Mr. James A. Farrell continued as president and also became chief executive officer. Mr. J. P. Morgan acted as chairman of the board but was not an executive officer.

In 1932, for the first time, I became an executive officer, being elected chairman of the board and chief executive officer, with Mr. William J. Filbert as vice-chairman and Mr. William A. Irvin as president. In 1933 Mr. Filbert succeeded me as chairman of the finance committee. As of Jan. 1, 1936, Mr. Filbert retired as chairman of the finance committee and was succeeded by Mr. Edward R. Stettinius, Jr. On Jan. 12, 1937, Mr. Enders M. Voorhees became vice-chairman of the finance committee. Mr. Benjamin F. Fairless succeeded Mr. Irvin as president and Mr. Irvin became vice-chairman of the board of directors as of Jan. 1, 1938.

#### Needed New Blood

In 1929 the Corporation had 39.4 per cent of the steel ingot capacity of the country, produced 40.1 per cent of the country's ingots and earned satisfactory profits. It was recognized, however, that the Corporation did not share sufficiently in the production of the flat rolled products used so largely by the automobile trade and in tin and terne plates, due primarily to lack of modern facilities for the production of such kinds of steel. The character of the steel consumption of the country had changed through the years. For instance, steel rails, which had amounted to 23 per cent of the national production at the time of the Corporation's formation, had dropped to 8 1/3 per cent in the 1928-29 period, while sheet and strip, which accounted for only 6 1/2 per cent in the early period, rose to 19 per cent in the latter period and tin plate rose from 3.3 per cent to 5 per cent. In 1936 steel rails accounted for only

3 1/2 per cent of the country's output, while sheet and strip rose to 31 per cent and tin plate to 8 per cent.

The trend of consumption was away from the heavy products where the Corporation was strongest and to the lighter flat rolled products where the Corporation did not possess the most up-to-date facilities. It was also evident that the directing personnel of the Corporation and of the subsidiaries must be infused with fresh blood in order the better to balance experience with enthusiasm and to ensure a succession of trained authority.

#### Charges Cut \$31,000,000

**I**N 1929 the financial structure of the Corporation was materially changed through the redemption of the mortgage bonds of the Corporation to the value of \$340,000,000. This was managed through the sale of 1,016,605 shares of common stock supplemented by a draft on current cash funds. Also \$30,000,000 of the bonded debt of subsidiary companies was then retired. That transaction relieved the Corporation of a charge of about \$31,000,000 a year. It is fortunately not necessary to speculate as to what would be the condition of the Corporation today, had it been required to pay this heavy interest charge during the depression years.

While the financial structure was being simplified and the burden of fixed charges lightened, the fundamental investigation as to whether the Corporation was unduly losing its position in the industry and what could be done about it was put under way. This survey was begun and carried forward until 1935 entirely by the engineers within the Corporation. Their findings were so far-reaching and involved expenditures of such magnitude that we decided it would be wise to gain an outside opinion and in 1935 we retained the firm of Messrs. Ford, Bacon & Davis to go through all of our properties, methods, personnel and markets and, in collaboration with our engineers and executives, to formulate definite recommendations.

#### Built from Ground Up

We began our survey in 1928—and from the ground up. We set about the preparation of an exhibition of all the property of the Corporation, showing the age, condition and adequacy of the various facilities. The problem before us was to appraise the various markets for steel, the extent of our participation in those markets as contrasted with what should be our reasonable participation, and, where

we were falling off, to discover why.

In all the markets for the heavier main rolled products, the Corporation stood well, but in the markets for the lighter flat rolled products, the Corporation did not stand so well. This, it appeared, was largely due to a lack of the proper equipment to produce the kind of finished steel as and when the new generation of customers wanted it. The property survey disclosed that a large number of the plants needed a considerable amount of money spent on them and that many were so located with respect to markets or raw materials, or both, that no amount of money could make them over into economical units. These last mentioned plants were scheduled for abandonment. Others were listed as of doubtful value and others were listed for progressive improvement.

It was determined, after a great deal of study, that the Corporation could achieve its highest efficiency by grouping its main producing units in the Pittsburgh district, the Chicago district and the Birmingham district. The Corporation had no adequate access to the Pacific Coast and so in 1930 the assets of the Columbia Steel Corp. were acquired for common stock, thus giving the Corporation a producing unit in every major market. In the same manner, the Oil Well Supply Co. was acquired in 1930 to give a better outlet in the important field of oil country goods, and, in order to round out the Corporation's cement-making division, the Atlas Portland Cement Co. was taken over and merged in 1930 with the Universal Portland Cement Co. under the name of the Universal Atlas Cement Co. The only other important company acquired was the Virginia Bridge Co. in 1936 in order to gain an outlet for bridge building materials in the South.

#### Location Factors Change

The steel industry, although in the popular mind a heavy industry with fixed locations, is, as a matter of fact, in some respects a mobile industry. Iron and steel are basic commodities, and a large part of their cost to the consumer is transportation. The ideal plant location is one where the cost of getting raw materials into the plant and getting the finished products out to the customers is at a minimum. This means, in a country the size of the United States, that, as consuming centers shift, the factors of location will change. A study of plant locations gets down to freight rates on raw



materials and freight rates on finished products to the logical markets.

**D**URING our 10-year period, the changes in the science of steel making came into our problem in a decisive way. The demand for open hearth steel made many plants obsolete that were built around the bessemer process. That is one change. A second and greater change was the demand for a character of finished steel that could be made only on continuous mills with highly refined processes.

Such mills represent large capital outlays and, while they are very economical if running full, they are very costly if running only on part time. Thus the concentration of production became a factor of such importance as sometimes to outweigh freight rates. In certain of our plants the obsolescence, taking that word in its broader significance, was such that their abandonment was scarcely a matter for discussion.

#### Abandoned Plants

But we proceeded very slowly with our program, getting rid of no facilities until we could see our way clear to take over their potential production in some other fashion, and during the rigorous period of the depression we largely suspended the program. Here, in brief summary, is the record of the plants abandoned, by years:

1928—Carnegie-Illinois: Bellaire Works, Bellaire, Ohio. Its production was entirely Bessemer and its business could be better handled at the Mingo plant. McCutcheon Works, Pittsburgh, Pa. Its merchant mills were obsolete and not worth rebuilding. The business was transferred to the McDonald Works. Milwaukee Works, Milwaukee, Wis. Its two blast furnaces were obsolete and its production could be better handled at Gary. Sheet and Tin Division—Old Meadow Works, Scottdale, Pa., and Pittsburgh Works, New Kensington, Pa. The mills were obsolete and too small to warrant rehabilitation. American Steel & Wire Co.: Salem Works, Salem, Ohio. A nail mill which was obsolete and not well situated.

T. C. & I.: Alice Furnace, Birmingham, Ala. Obsolete.

1929—T. C. & I.: Bessemer Furnaces, Bessemer, Ala. Blast furnaces that had become obsolete.

1930—Carnegie-Illinois: Lower Union Works, Youngstown, Ohio. Five merchant mills that were obsolete. The production could be better handled at the McDonald Works.

1931—Carnegie-Illinois: Sheet and Tin Division—Pennsylvania Works, New Kensington, Pa.; Aetna-Standard Works, Bridgeport, Ohio; Chester Works, Chester, West Virginia; Leechburg Works, Leechburg, Pa. These small mills, producing plates, sheets and tin mill products, were obsolete and had no place in the larger program.

American Steel & Wire Co.: H. P. Works, Cleveland; Braddock Works, Braddock, Pa.—the first producing wire nails and the second wire. Obsolete and badly situated.

1934—Carnegie-Illinois: Sheet and Tin Division—Wellsville Works, Wellsville, Ohio, and New Philadelphia Works, New Philadelphia, Ohio. Both obsolete producers of black sheets.

National Tube Co.: Pittsburgh Works, Pittsburgh—Pennsylvania Department, producing black pipe for which there was little demand, and Republic Department producing a small tonnage of seamless couplings which could be better produced elsewhere.

American Steel & Wire Co.: Morris and Bailey Division, Wilson, Pa. A small cold rolled strip mill with obsolete facilities, badly located.

1935—Carnegie-Illinois: New Castle Steel Works, New Castle, Pa. A large but obsolete Bessemer plant whose production, like that of the Bellaire Works, could be better cared for by other plants in the district. Sheet and Tin Division—Dover Works, Dover, Ohio. A small, obsolete plant turning out black and galvanized sheets.

American Steel & Wire Co.: Central Blast Furnaces, Cleveland. Two obsolete blast furnaces. Newburgh Steel Works, Cleveland. An obsolete plant. Duluth Works, Duluth, Minn. One blast furnace and five open hearth furnaces that were both obsolete and uneconomically located.

1936—Carnegie-Illinois: Joliet Works, Joliet, Ill. Dismantled in part as to its Bessemer production.

American Steel & Wire Co.: Farrell Works, Farrell, Pa. Obsolete and not well located.

American Bridge Co.: American Plant, Chicago, Ill. A small, obsolete plant with a business that could be better handled elsewhere.

1937—Carnegie-Illinois: Carrie Furnaces, Rankin, Pa., and Lucy Furnaces, Pittsburgh, Pa. Three obsolete furnaces. Sheet and Tin Division—Cambridge Works, Cambridge, Ohio; Sabraton Works, Morgantown, West Virginia; and Scottdale Works, Scott-

dale, Pa. The first two produced tin mill products and the third galvanized sheets. All were small, obsolete and badly located.

#### Canadian Plants Sold

**O**THER plants were disposed of by sale. The small St. Louis plant at St. Louis, Mo., and the somewhat larger Lassig plant at Chicago, Ill., of the American Bridge Co. were sold in 1928 and 1929. In 1935 the Cherryvale plant at Cherryvale, Kan., of the Edgar Zinc Co., was sold, and in 1937 the Corporation disposed of its Canadian interests because, due to the prohibitive taxes imposed under the Canadian-Empire agreements, they were no longer outlets for semi-finished material. These included the Canadian Steel Corp., Ltd., at Ojibway, Ont., making galvanized sheets, tin plate and wire products, and the Canadian Bridge Co., Ltd., at Walkerville, Ont., with bridge and tower shops.

During the ten years, there were thus abandoned, dismantled or sold plants with an annual finished product capacity of 1,700,000 tons and an ingot capacity of 2,225,000 gross tons. The bookkeeping magnitude of getting rid of this portion of the Corporation's property may be realized by these charges to the reserve for replacements and retirements made during the period 1928-1937: During this period the sum of \$469,315,401 was set aside for depreciation, depletion and obsolescence, and additional provisions of \$116,220,028 were charged to surplus for these same purposes. Of these reserves there was written off to property on account of retirements and replacements a total of \$210,932,325.

The survey, as it proceeded, brought out that the Corporation was strongest, as has been mentioned, in those heavy products for which temporarily there was the least demand. It also brought out a considerable number of overlapping activities and a lack of modern facilities to produce the kind of sheets, plates and tin plate that the market demanded.

#### Executives Are "Finest"

Much of the overlapping of activities was overcome by combining the Carnegie Steel Co. and the Illinois Steel Co. and later merging with them the American Sheet & Tin Plate Co. Adjusting the human factor in both production and sales is a continuous and always difficult problem, but it was made easier by the presence within the Corporation of what I think is the finest body of executives that





MYRON CHARLES TAYLOR . . . "It is an enduring satisfaction to all of us to have been steadfast amid danger. . . . I have no doubt whatever of the ultimate fate of both the Nation and the Corporation." Thus Mr. Taylor looked at his ten years' leadership of United States Steel Corp., from which, on April 4, 1938, he resigned as chairman of the board of directors.



have ever grown up in any organization. And so, in rearranging the personnel, it has been necessary to bring in only a few men from the outside. It has been possible to fill most of the positions by shifting men already in the Corporation's service. The changes have been thorough, and by 1937 comparatively few men and none of the subsidiary presidents held the same positions that they filled in 1928. In every case the men displaced had either arrived at the pension age or were otherwise provided for.

WE inaugurated in 1928, on the basis of the reports of the corporation's engineers, a system of definite budgets and forecasts. Owing in part to the financial conditions and in part to the rest period prescribed in the Steel Code under the NRA, the corporation has not been able to proceed with its physical changes at the full speed of the budgetary estimates. The situation may be visualized by the amounts which the finance committee felt able to recommend compared with the amounts recommended in the budget. For 1929 this was 55 per cent; for 1930, 53 per cent; for 1931, 5.2 per cent; for 1932, 6.5 per cent; for 1933, 11.6 per cent; for 1934, 15.3 per cent; for 1935, 46.7 per cent; for 1936, 50.7 per cent; and for 1937, 49.3 per cent. Nevertheless, the corporation, from Jan. 1, 1928, to Dec. 31, 1937, spent for additions, betterments and modernization the sum of \$562,569,358 and there were unexpended balances on Dec. 31, 1937, on approved authorizations for these purposes, of about \$80,000,000. This makes a total of \$642,569,358. The distribution of the expenditures has been as follows:

Manufacturing properties, including by-product coke plants	\$457,330,172
Coal properties	15,253,063
Iron ore properties (incl. stripping)	2,039,815
Limestone and flux properties	12,254,591
Transportation—railroads	68,328,538
Water service	13,880,981
All other properties	4,021,842
<b>Total</b>	<b>\$573,109,002</b>
Less: Proceeds creditable to property investment account from dismantlement and sales of sundry property	10,539,644
<b>Net expenditures on property investment account</b>	<b>\$562,569,358</b>

These expenditures do not represent the carrying out of a program of expansion. The program has been primarily one of rehabilitation in order to meet trade demands. In most cases the new equipment has a somewhat larger capacity than the equipment replaced, but the additions have been

incidental to the main objective. For instance, in the ten years, the corporation has abandoned nearly five million tons of finished rolled capacity, while the new facilities already built or under way will have a capacity of about six million tons. The objective has been efficiency. We desire only to keep pace with the growth of the national market.

#### New Markets Opened

Considerable expenditures have been made for the making and rolling of alloy and stainless steel, for the substitution of seamless pipe for lap weld pipe and for the substitution of welding mechanism for riveting in the fabrication of steel, but the greatest expenditures have been made to provide modern facilities for the production of flat rolled products. It is here that the revolution in steel products has taken place.

The four-high continuous or semi-continuous sheet and strip mills roll a quality of product which could not be duplicated on the old-style mills, and the further processing of this material into sheet and tin plate products by cold reduction in four-high continuous cold mills results in commodities much superior, both as to surface and physical properties, to that obtained by the older methods.

These improved products have made possible the light all-steel automobile and the light all-steel train, and undoubtedly we are only on the threshold of the changes in industry which will come about as the uses of this material are extended.

The use of cold reduced tin plate for the manufacture of cans in some cases greatly improves the quality of the finished article over hot rolled tin plate—formerly the only material available. Certain food products appear to be less difficult to preserve in the newer tin plate than in the old, thus broadening the use and extending the market into new fields.

Including the mills now under construction, the corporation has installed four-high mill capacity of 4,321,200 gross tons of hot rolled flat products. The largest development has been the new Irvin plant on the Monongahela River above Pittsburgh in the heart of the corporation's producing area. This plant will be able to produce 600,000 tons a year of sheets, strip and tin plate in the most modern and economical manner and will substitute for production in the district which is obsolete or will shortly become so.

The second largest installation is at

Fairfield, Ala., in the Tennessee Coal & Iron property which will make cold reduced tin plate for the Southern and Far Western markets. The expenditures already made or in contemplation will by no means complete the physical reorganization of the corporation, but they will give it the physical facilities to hold its own in every market.

#### Three-Fold Task

The management of the Steel Corporation is by no means limited to a steel making job, for, to repeat, the corporation has a three-fold obligation. But the making of steel is most certainly not a financial job and neither is it one that can be managed at long range. Therefore, as early as 1932, we planned to separate the actual making and selling of steel from the overall and financial administration and in that year we incorporated the United States Steel Corp. of Delaware. Events postponed the carrying out of that plan, but as of Jan. 1, 1938, it was put into execution and the coordination of all the iron and steel making activities of the subsidiaries of the corporation has been concentrated in the new corporation with headquarters at Pittsburgh. Thus henceforth steel making and selling will be carried on in a steel making atmosphere—that is, on the ground—while the financial and general policies will remain with the corporation.

THE directorate of the Delaware corporation includes the heads of the leading subsidiaries and is primarily an operating group, with only two men from the financial side of the New York office. The list of directors elected on Dec. 8, 1937, is as follows: William Beye, Chicago; A. N. Diehl, San Francisco; B. F. Fairless, Pittsburgh; Robert Gregg, Birmingham; B. F. Harris, Pittsburgh; C. F. Hood, Cleveland; M. D. Howell, Pittsburgh; G. C. Kimball, Chicago; Walther Mathesius, Chicago; C. V. McKaig, Pittsburgh; Thomas Moses, Pittsburgh; L. A. Paddock, Pittsburgh; J. L. Perry, Pittsburgh; C. H. Rhodes, New York; E. R. Stettinius, Jr., New York; E. M. Voorhees, New York; and R. E. Zimmerman, New York.

The executive personnel was organized thus: president, Benjamin F. Fairless (also president of the parent U. S. Steel Corp.); vice-president, raw materials, Thomas Moses; vice-president, operations, Walther Mathesius; vice-president, sales, C. V. McKaig; vice-president, counsel and industrial relations, William Beye; vice-president, finance, and secretary



and treasurer, Max D. Howell; vice-president, research, R. E. Zimmerman; vice-president, purchases, C. H. Rhodes; vice-president, special duties, New York, Harold L. Hughes.

#### **Fabric Is Emerging**

An executive committee was appointed as follows: Benjamin F. Fairless, chairman; William Beye, B. F. Harris, C. F. Hood, Max D. Howell, Walther Mathesius, C. V. McKaig, Thomas Moses, J. L. Perry, E. R. Stettinius, Jr., E. M. Voorhees, and R. E. Zimmerman.

The responsibility for managing the properties as producing and selling units is now squarely on the shoulders of the executives in the field.

The reorganization and rehabilitation have proceeded according to a definite plan. Now the strands have been picked up and the fabric is emerging.

I have told of men, of money and of things. They are not enough of themselves to form a modern industrial unit capable of discharging both its public and its private obligations. There must be an inquiry into the nature of things, in order that the output of the corporation may be of a constantly increasing usefulness. In other words, there must be both pure and applied research—the pure research to extend our horizons and the applied to make better that which we already know. Ten years ago we set up a central research laboratory at Kearny, N. J. Since then metallurgy and research have been elevated into a major division of the corporation; that is, metallurgy and research now rank with production, sales and finance.

#### **Science Is Rein, Spur**

At the close of 1937, we had 174 laboratory departments throughout the corporation. Most of these laboratories are for the metallurgical control which is an essential part of today's steel making. Others work on the problems of customers. Still others are experimenting with materials for new uses or searching for new uses for materials already in existence. A few are in pure research. An idea of the scope of the work may be had from the fact that the item of metallurgy and research cost \$8,400,000 in 1937. It is impossible in the space here at command even to sketch the positive accomplishments of the research division.

It is enough to say that it has been fully demonstrated that the corpora-

tion could not function as a producing unit today without the rein and the spur of science. As is the case with every division of the corporation, the metallurgic and research activities have been surveyed by outside experts to discover how their usefulness may be extended.

**I**N recording the course of the relations between the corporation and those who work for it, I shall not use the term "industrial relations" because those words connote a picture not only of an impersonal relation but also of something that is carried on in a vacuum. If enough dollars are not received to make adequate yearly payments to the workers in the form of wages and to make adequate yearly payments to the owners in the form of dividends, the discussion of labor policies becomes largely academic. For no form of words will take the place of dollars.

The pressing labor problem through seven of the 10 years under review has been to find work and dollars. Therefore, discussing labor relations as a thing apart and having nothing to do with the daily operations of the corporation as a whole is utterly unreal.

The corporation has a long and honorable labor record. The proof of the soundness of its labor policies is to be found in the attitude of the men employed.

#### **Period of Mechanization**

It is noteworthy that the first dozen years of the corporation covered the change of iron and steel making from an essentially hand craft to an essentially machine craft, while the last ten years have seen the advent of a more complete mechanization.

Such changes in method mean changes in the character of jobs and revisions in the rates of pay, with all the opportunities for dissatisfaction that must always accompany revision. The effect of mechanization has been to revise the rates of pay upward. Steel making today is a highly mechanized industry requiring a large amount of skilled labor and comparatively little unskilled labor. But it was demonstrated during part of 1937 that, with anything like a normal demand for iron and steel, the production will increase at a rate to require additional employees according to at least the rate of increase of the working population. The former unskilled

workers have, on the whole, been absorbed as skilled workers. Given normal conditions and given normal earnings with which to finance obsolescence and expansion, the industry will in the future do more than its share in providing good jobs for men.

#### **Conditions Never Normal**

During no time since I became chairman of the finance committee in December, 1927, have conditions been what could be called normal—no matter how the meaning of that word may be stretched.

No particular human problem presented itself during the boom years 1928 and 1929 and there was no change in the basic rate for common labor during those years. In fact there was no change in this rate from 1924 through 1930—which does not, however, mean that there was no change in the earnings of the men. The men earned more through steadier work. Their average earnings in 1928, for instance, were 12 per cent higher than the average rate paid by the leading industries. The corporation earned fair profits and part of the savings due to volume were passed on to the public in lower prices. A weighted average of the prices received by the corporation for its principal products, taking 1914 as 100, gives 180 for 1924, 166 for 1926 and 157 for 1928.

#### **Work-Sharing Plan Adopted**

When it developed, toward the end of 1929, that a depression was actually on and that orders could not be had in a volume sufficient to retain the full complement of men, we proposed a very simple expedient, but one which was really a very fundamental thing.

The authorities at Washington had requested the industrialists of the nation to sustain wages. Under the conditions then existing, a slash in steel prices could only have served to make the panic more panicky and could not have brought more business. Buyers do not pick up bargains in steel unless they can see a way of getting rid of their purchases at a profit, and at that time no one could see any way of getting rid of anything at a profit.

We worked out a plan by which we would not discharge anyone but would keep the full force of men at full hourly rates and share the work as equitably as possible. That policy not only was adopted by the corporation, but also it was urged by the President

of the United States, and I with others became active in a nation-wide movement to "share the work."

*In next week's IRON AGE, Mr. Taylor discusses United States Steel's efforts at research and tells of events in the organization's relations with its employees which led up to the signing in March 1937 of the union contract between United States Steel subsidiaries and John L. Lewis' Steel Workers Organizing Committee.*

### Nice Displays Ball Bearings At Franklin Institute

THE NICE BALL BEARING CO. of Philadelphia has recently completed a new action exhibit at the Franklin Institute, Philadelphia. A novel system of gears and motors, controlled with a time switch, demonstrates the versatility of ball bearings in various types of mechanical usage. Standard and special ball bearings are also exhibited. Chief attraction is a "Magic Spiral," showing how frictionless ball bearings are.

### Tantaloy Cutting Metal In Bar Form

THE inherent toughness of Tantaloy, the hard tantalum carbide cutting metal made by the Fansteel Metallurgical Corp., North Chicago, Ill., has led to a new technique and a new method of making tools for steel cutting, according to an announcement by the company.

Strength, coupled with high resistance to abrasion and "cratering," makes it practical to use very thin tips on cutting tools. This brings the steel shank sufficiently close to the tip so that heat is carried away rapidly and effectively. It is stated that in machining steel, Tantaloy tips 1/16 to 1/8 in. thick actually perform better than thicker tips.

The thin tip tools are made by applying the hard metal in bar form with an acetylene torch, rather than by the conventional method of brazing. In making flowed-on tools, the shank is recessed by milling or grinding. Ordinary carbon steel may be used, or the Tantaloy may be applied to high speed steel tools which have worn undersize. After the Tantaloy is sweated on, the tool is ground. No hardening or tempering is necessary.

Finished tools, "Milled and brazed" tools, square end tools, and Tantaloy metal in bars 1/4 in. diameter, 9 in. long, coated with Fanflux, are obtainable from the Michigan Tool Co., Detroit, the Illinois Tool Works, Chicago, or direct from the manufacturer.

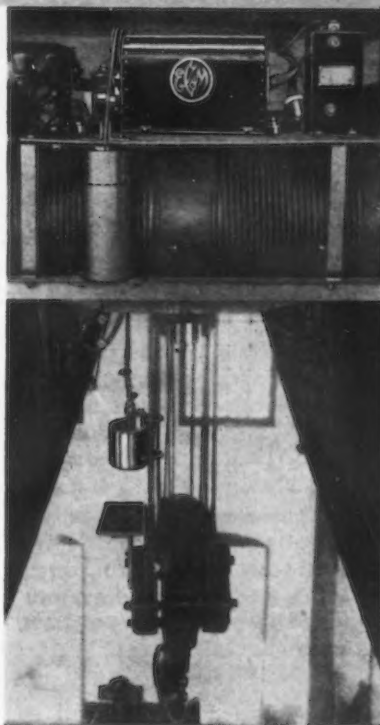
### Rail Welding Booklet Issued

APPLICATION of the thermit process in the welding of rails is covered in a booklet entitled "Con-

tinuous Rail for Main Line Tracks," issued by the Metal & Thermit Corp., 120 Broadway, New York. In addition to discussion of potential savings by elimination of rail joints through the continuous welding of rails, the question of expansion and contraction is discussed and data given on the behavior of long rails in service. Installations to date in the United States, Europe and Australia are described. The booklet contains 36 pages and is profusely illustrated.

## EVERY CRANE needs this SAFETY LIMIT STOP

For preventing overhoisting accidents on alternating and direct current cranes —also used for limiting travel of hot metal mixers, tilting furnaces, final skew-limit on ore and coal bridges, etc.



General Purpose Crane with  
Youngstown Safety Limit Stop



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FOR CRANES, MILL DRIVES AND  
MACHINERY • BRAKES • LIMIT  
STOPS • LIFTING MAGNETS AND  
AUTOMATIC WELD TIMERS

Every crane needs the Youngstown Safety Limit Stop. Not only is it a check against human error, but it also removes the mental hazard of an overhoisting accident from the operator's mind, thus enabling him to do better work.

Operated directly by the hook block, this Limit Stop not only disconnects the motor from the line, but brings it to a quick stop. And the final stopping point is in no way affected by stretching of the cables.

Make your cranes safe with Youngstown Safety Limit Stops. Ask for Bulletin 1035-B illustrating how this Stop is easily applied to new or old cranes.

THE ELECTRIC CONTROLLER  
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Cleveland, Ohio



## ...OBITUARY...

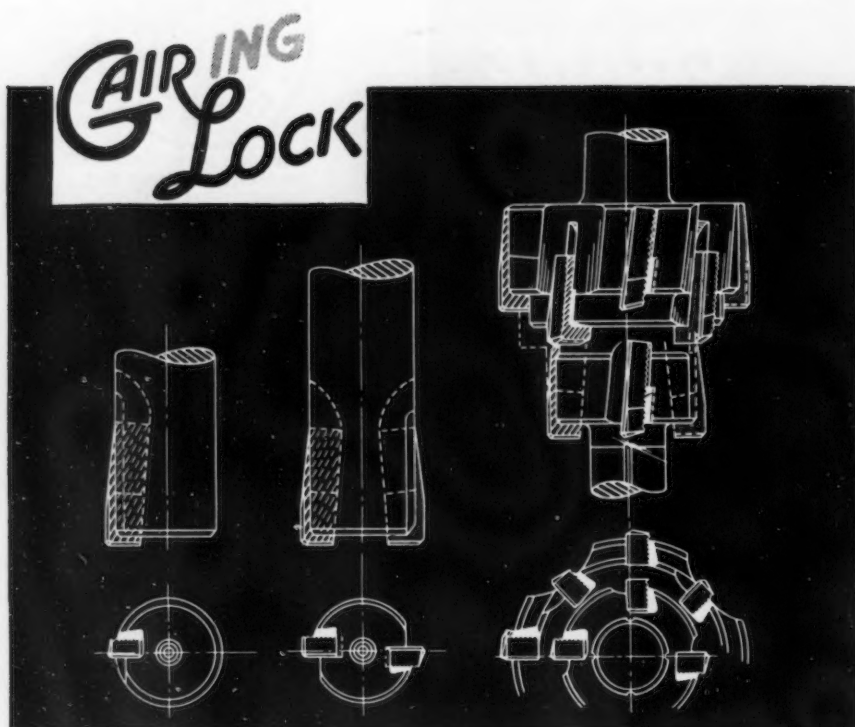
LAWRENCE K. SLABACK, manager of sales at the Cincinnati, Ohio, district sales office of Carnegie-Illinois Steel Corp. and Tennessee Coal, Iron & Railroad Co., died in West Palm Beach, Fla., March 29. He was 56 years old. Mr. Slaback was associated with U. S. Steel Corp. subsidiaries at the Cincinnati office for more than 37 years. He started as a stenographer

with the former American Sheet & Tin Plate Co., later becoming order clerk and chief clerk. In 1922 he was named assistant manager of sales. From 1927 to 1936 he was manager of sales and at the tin plate company's consolidation with Carnegie-Illinois, Mr. Slaback was named district manager of sales.

♦ ♦ ♦

OTTO J. GROEHN, for more than two decades a leader in automotive engineering, died March 23, aged 49 years.

He had been an invalid for nearly three years. Mr. Groehn contributed much to the development of the old Briscoe Mfg. Co. where he served his apprenticeship, and later at Clayton & Lambert Mfg. Co. and the Hudson Motor Car Co. In the latter two, he served in an executive capacity and was responsible for the development of numerous manufacturing processes and inventions. At Clayton & Lambert he was responsible for the development of its metal stamping division. When the Hudson company purchased Clayton & Lambert's Gratiot Avenue stamping plant, it is said that a condition of the transfer was that Mr.



## GAIR-LOCK is an All Purpose Blade

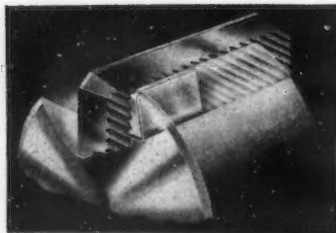
Applicable to all types of cutting tools from single point boring bars to the most complicated alternate tooth and multiple diameter cutters. Can be transposed from one head to another.

Adjustable on diameter and length to uniform setting. Blade always seats on bottom of blade slot. Locks tight and rigid even after repeated re-grinds have reduced it to a mere nubbin.

Ask for Bulletin 401.

**The Gairing Tool Co., Detroit, Mich.**

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SHELL, SIDE, FACE, INTERLOCKING,  
ALTERNATE TOOTH AND MULTIPLE DIAMETER



Blade GAIR-LOCKED in position in cutter head. Patent pending.



L. K. SLABACK

Groehn would consent to join the automobile company.

In his new connection he was responsible for the development of the Hudson system of body production and directed the erection of its body plant and the completion of an organization for its operation. Although few believed it possible, within one year from the date the ground was broken, Mr. Groehn had it in operation, producing bodies at the rate of 1600 per 9-hr. day. After nearly six years with Hudson, he returned to Clayton & Lambert as vice-president and general manager. His last years before his retirement in 1935 were spent as manager of the Hudson body plant. He aided in building the first all-steel automobile body in Detroit.

♦ ♦ ♦

FLOYD F. CORCORAN, personnel director of the Chevrolet Flint Division,



died March 24 in Hurley Hospital, Flint, from a throat infection. First employed by the Chevrolet Motor Co. as a dock-hand in 1920, Corcoran became personnel director in 1934. He was also an executive of the Industrial Mutual Association and the Flint Industrial Executive Club.

♦ ♦ ♦

JOHN SCOTT CRAIG, formerly an official of the Riter-Conley Co., Pittsburgh, died March 30 at his home in Pittsburgh. Mr. Craig was a member of the board of directors of the National Fireproofing Co. and the Pittsburgh Screw & Bolt Co. He has been retired for 30 years. He was 81 years old.

♦ ♦ ♦

HARRY P. FORKER, at one time secretary of the old Sharon Tin Plate Co., died March 28 at Sharon, aged 74 years. Born in Sharon, he became associated with his brother-in-law, the late Frank H. Buhl, in the steel business and was connected with a number of Sharon plants, including Sharon Iron Works and Buhl Steel Co. In 1901 he was elected secretary of Sharon Tin Plate Co. Two years later the company was taken over by United States Steel Corp. and Mr. Forker then retired to manage an estate.

♦ ♦ ♦

JEREMIAH BINGHAM, president and treasurer, Toledo Stamping & Mfg. Co., Toledo, Ohio, died March 29 in Miami, Fla., after an illness of three weeks. Mr. Bingham was born in Birmingham, England, and came to this country in 1895. He became an expert tool and die maker and after working for numerous companies, he helped form the Acklin Stamping Co., Toledo, and the Bingham Stamping Co., prior to organizing the Toledo Stamping & Mfg. Co.

♦ ♦ ♦

FLETCHER L. BYRON, veteran in the purchasing department of American Steel & Wire Co., Cleveland, died March 29 of a heart attack.

♦ ♦ ♦

GEORGE CANNING, former secretary of the Cleveland City Forge & Iron Co., Cleveland, and former president of George Canning & Co., iron and steel brokerage firm, died March 31 at Fort Worth, Texas, where he had recently made his home. He was 74 years old.

♦ ♦ ♦

GEORGE BAUMGARTEN, formerly active in several belting companies, was buried March 29 in Detroit. Mr.

Baumgarten was born in Germany 75 years ago and had lived in this country for 52 years, first in Detroit and then in Milwaukee. He returned to Detroit 27 years ago. For 15 years he was superintendent of the Armstrong Tanning Co. and then went to the Detroit Oak Belting Co., retiring eight years ago.

♦ ♦ ♦

JAMES K. CHALMERS, president of the Saw & Specialty Corp., was buried March 29 in Detroit. Mr. Chalmers,

who died March 26 in St. Petersburg, Fla., was born in Edwardsburg, Ont., in 1862. He spent his youth in Potsdam, N. Y., and at the age of 19 enlisted in the Third Regiment of the United States Cavalry and saw active service in the Indian Wars in Arizona and other Western States, including the campaign against Sitting Bull. He went into the saw business in Chicago and in 1910 moved to Canada to become associated with the Canadian branch of an American saw manufac-

# ARMSTRONG



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Labor and material prices may be beyond your control, but you can eliminate needless waste of both hours and of cutting steels by using ARMSTRONG TOOL HOLDERS for all operations on all lathes, slotters and shapers. Today with ARMSTRONG TOOL HOLDERS as available as the nearest supply house, you can label as wasted any time spent in forging tools: can save 70 per cent of the grinding time and cut high-speed steel consumption 90 per cent on every operation that you change over from forged tools to ARMSTRONG TOOL HOLDERS.

By adopting the Armstrong System all the way, you can end needless investment in stocks of costly High Speed Steel and numberless bar tools. Each ounce

of steel in an ARMSTRONG TOOL HOLDER does the work of 10 ounces in a bar tool, and you can eliminate losses in heavy tool stumps. With the complete System you are permanently tooled-up, are ready to start every operation without delay. You can step up speed and feeds—for you have stronger, more efficient tools than any "tool dresser" can forge. You can turn out more work per machine, per man and per hour and keep cutting costs on the profit side.

If you haven't studied the ARMSTRONG SYSTEM recently, it would pay you to take a new ARMSTRONG B-35 catalog through your shop and check your tool set-up for each operation on all machines.

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turing company. In 1918 he went to Detroit from Toronto to establish his firm there.

♦ ♦ ♦

RICHARD BATESON, associated with the Russell Wheel & Foundry Co., Detroit, died March 30 at the age of 82. He was born in England but had spent most of his life in Detroit.

♦ ♦ ♦

THOMAS H. MCKENNEY, a retired employee of Carnegie-Illinois Steel Corp., died at his home last week of

coronary thrombosis, aged 70 years. Beginning as an inspector at South works of the Illinois Steel Co. in 1892, Mr. McKenney served there continuously until his retirement on April 30, 1936. He became supervisor of labor and safety Jan. 1, 1917, and served continuously in that position for 19 years. At the time of his retirement he was manager of welfare.

♦ ♦ ♦

FREDERICK T. MOORE, first vice-president and general works manager

of the Colt's Patent Fire Arms Co., died at Hartford, Conn., on March 31, aged 62 years. He recently underwent an operation. He became vice-president of the company Jan. 19, 1934.

♦ ♦ ♦

EARLE J. BYERLEIN, president of the Milwaukee Foundry Equipment Co., Milwaukee, died on March 30, aged 46 years. He was born in Saginaw, Mich., and settled in Milwaukee in 1918, establishing the equipment firm in the following year. He had lived on his citrus fruit ranch at Progreso, Texas, for the past two years, although he made frequent visits to Milwaukee in his capacity as head of his firm.

♦ ♦ ♦

LIONEL D. WHITEHEAD, chairman and managing director of Whitehead Iron & Steel Co., Ltd., England, died suddenly on April 3, aged 60 years.

♦ ♦ ♦

THOMAS E. DRAKE, station master and general yard master of Baltimore & Ohio Railroad, Pittsburgh, died March 28 at his home in Pittsburgh. Mr. Drake was an employee of the railroad for 40 years. He was 54 years old.

♦ ♦ ♦

LOGAN THOMAS WOOD, vice-president and general manager of Gar Wood Industries, Inc., one of the eight brothers of GAR WOOD, died of pneumonia Monday in San Francisco while on a business trip. Born in Duluth, Jan. 4, 1887, Mr. Wood early in his business career centered his interest around the automobile business in Duluth. In 1917 he became Chicago branch manager of the Wood Hydraulic Hoist & Body Co., founded and owned by his brother. When Wood acquired the Horizontal Hydraulic Hoist Co. of Milwaukee, Logan was made president of that company. In 1921 he went to Detroit to accept the position he held at the time of his death.

♦ ♦ ♦

ALBERT P. GROHENS, for many years president of the Lambert Machine Co., Marshall, Mich., died suddenly at his home in Bremerton, Wash., on Monday, at the age of 70 years.

♦ ♦ ♦

HERMAN F. BAETZ, retired treasurer, Westinghouse Electric & Mfg. Co., East Pittsburgh, died March 28 at his home in Pittsburgh. Mr. Baetz started with Westinghouse in 1889



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CHEVRON PACKING is so constructed that it adjusts itself automatically to compensate for variations in pressure. The exclusive hinge-like, cross-sectional shape expands as the pressure increases and contracts as the pressure decreases. Friction on the rod and on the packing itself is thereby reduced to a minimum. The performance of GARLOCK Chevron is remarkably efficient and economical on all types of equipment and in many industries. It will cut your packing costs.

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as paymaster and continued with that company until his retirement a few years ago. He was 68 years old.

❖ ❖ ❖

WILLIAM H. BOTTEN, president, Owen Bucket Co., Cleveland, died March 27 in Cleveland after a month's illness. He was 73 years old.

## Permanent Research Urged By Iron Alloy Group

ESTABLISHMENT of research in iron alloys on a permanent basis is urged by the Iron Alloys Committee of the Engineering Foundation in a report, covering eight years of investigation, which was financed by 71 manufacturers and engineering societies.

The committee recommends the endowment of fellowships "to undertake the acquisition of new knowledge of alloy steels and cast irons in those gaps which the committee's work has disclosed in our knowledge of ferrous alloy systems." A survey is suggested of all colleges where metallurgy research is carried on with a view to setting up fellowships in these institutions.

## Manchukuo's Pig Iron Aim Is 5,000,000 Tons by 1941

TOKYO (By Mail).—Annual production of pig iron in Manchukuo is expected to reach 4,000,000 to 5,000,000 gross tons by 1941, according to investigations made by President Kobiyama of the Showa Steel Works, Anshan, Manchukuo. Steel materials will be turned out at the rate of 1,000,000 tons from 1941, the last year of the current iron and steel production expansion plan. This scheme is based on the present supply situation, but its goal may be placed higher. Mr. Kobiyama added, in view of the recent discoveries of better grade ores in Tungpiangtao province.

## Milling Machine Practice

CINCINNATI MILLING MACHINE & CINCINNATI GRINDERS, INC., Cincinnati, Ohio, has issued under the above title a reprint of the section supplied by Hans Ernst and Mario Martellotti, of this company, which is incorporated in the

latest edition of Kent's Mechanical Engineers Handbook.

The material covers an analysis of the milling program, the various forms and dimensions of milling cutters, the use of milling cutters, and a description of the types and uses of modern milling machines.

## Financial Notes

National Steel Corp., Pittsburgh, at the annual meeting of stockholders last week elected

as directors Ernest T. Weir, Frank W. Blair, Maurice Falk, George R. Fink, Howard M. Hanna, George M. Humphrey, Thomas E. Millsop, Edmund W. Mudge, Carl N. Osborne, and Charles M. Thorp.

Pittsburgh Steel Foundry Corp., Pittsburgh, reports net income for 1937 of \$175,985, equal to \$30.35 per share on preferred stock, on which there is an accumulation of unpaid dividends, compared with net income of \$170,507 or \$29.41 a share in 1936.

Aetna-Standard Engineering Co., Youngstown, reports net profit for 1937 of \$169,089 after all charges, compared with \$1835 in 1936.

Empire Sheet & Tin Plate Co., Mansfield, Ohio, reports 1937 net earnings of \$243,415 before bond interest and depreciation, compared with a deficit of \$151,420 in 1936.

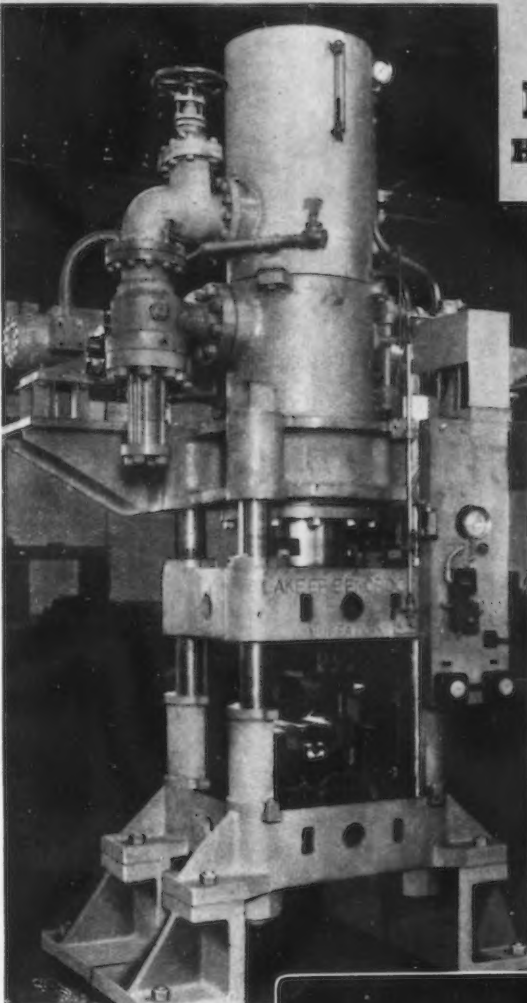
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### HYDRAULIC PRESSES



The reputation of industrial machines can be accurately judged by the standing of the concerns who buy them. This new 300 ton High Speed Lake Erie Hydraulic Press was designed to meet exacting production requirements of the Bendix Products Corporation.

Included in its cost reducing features are speed of 22 ten inch strokes per minute . . . easy, accurate control of pressure . . . selector for jogging, or various cycle operation . . . push button control . . . strength and rigidity for precision work and long die life.

You are invited to take advantage of the broad experience of Lake Erie Engineers in designing and building hydraulic presses in a wide range of capacities for modern production requirements with new economy.

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Machinery.*

# LAKE ERIE

## ENGINEERING CORP.

### BUFFALO, N.Y. U.S.A.



# ... NEWS OF THE WEEK ...

## Iron and Steel Engineers Will Visit Sparrows Point Mills

**M**ORE than 1000 steel mill executives and operating engineers are expected to take part in proceedings of the Association



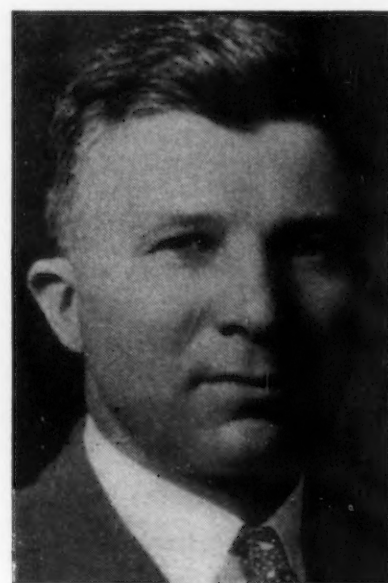
L. F. COFFIN

of Iron and Steel Engineers' annual spring conference in Baltimore April 28 and 29.

In addition to presentation of several technical papers, a feature of the meeting will be an inspection trip to Bethlehem Steel Co.'s 56-in. hot and cold strip mills and the new rod and wire mills at Sparrows Point, Md., on April 29. L. F. Coffin, superintendent, mechanical department, Bethlehem Steel, Sparrows Point, is general chairman of the program and president of the association. F. O. Schnure, electrical superintendent, Bethlehem Steel, is general chairman of the arrangements committee.

Following an informal dinner at the Lord Baltimore Hotel April 28, a technical session will be held at 8 p.m. and the following papers will be presented: "Instrumentation of a Modern Hot and Cold Strip Mill" by J. L. Whitten, Brown Instrument Co., and R. H. Ellis, United Engineering & Foundry Co.; "Forged Rolls" by J. R. Adams, superintendent, special products division, Midvale Steel Co.; and "The Chemistry of Lubrication" by George F. Bowers, Standard Oil Co. of Indiana.

The second technical session will convene at 8.30 a.m. Friday, April 29, at which time the following papers will be given: "Study of Power Re-

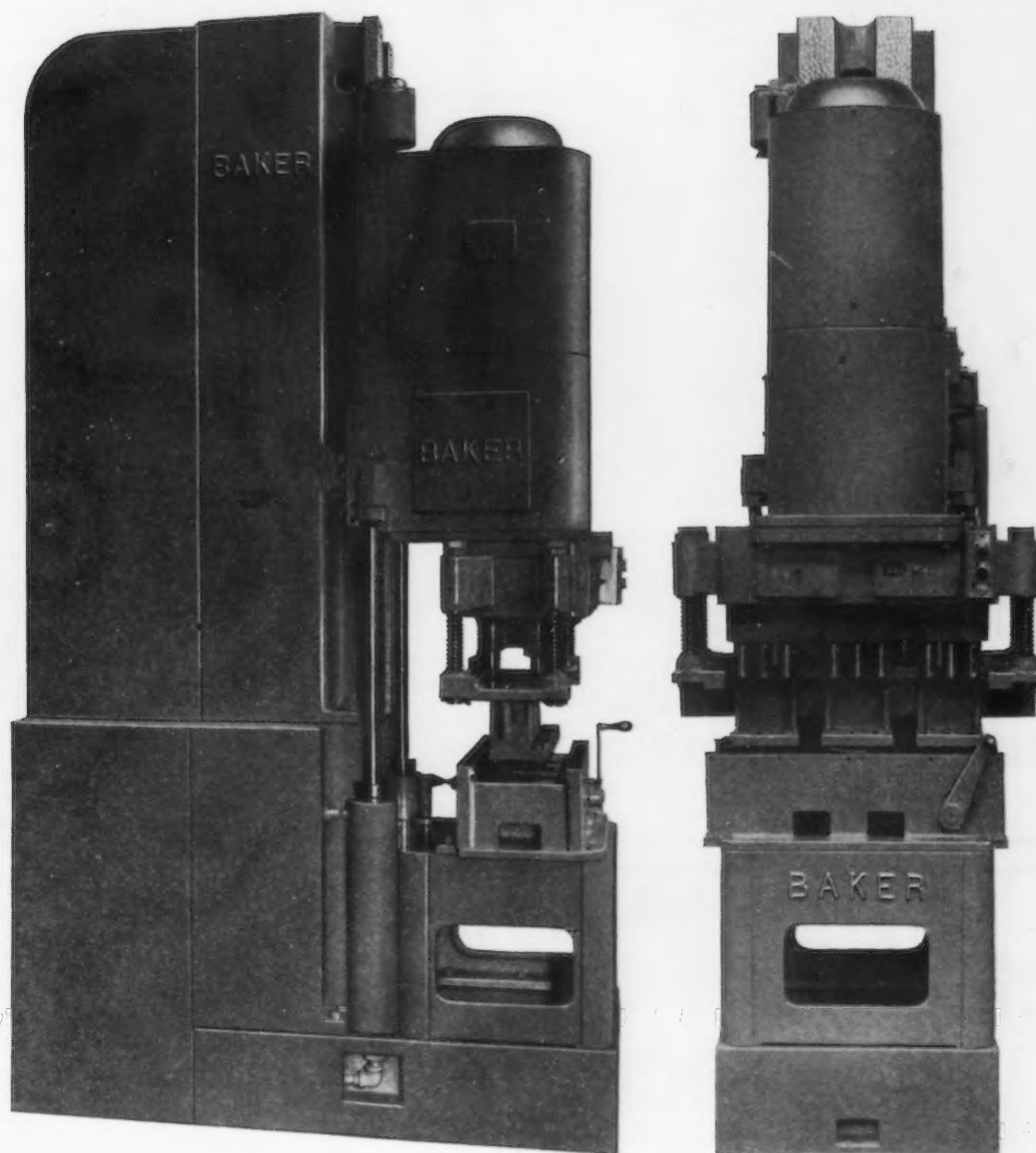


F. O. SCHNURE

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# No. 26 HO BAKER "CLEANLINE"



Hydraulic feed drilling machine with multiple head and fixture for drilling 10 holes through valve chamber in cylinder block.

Baker drilling machines, standard and special, are made in a wide range, both single or multiple spindle, for specialized production or miscellaneous work.

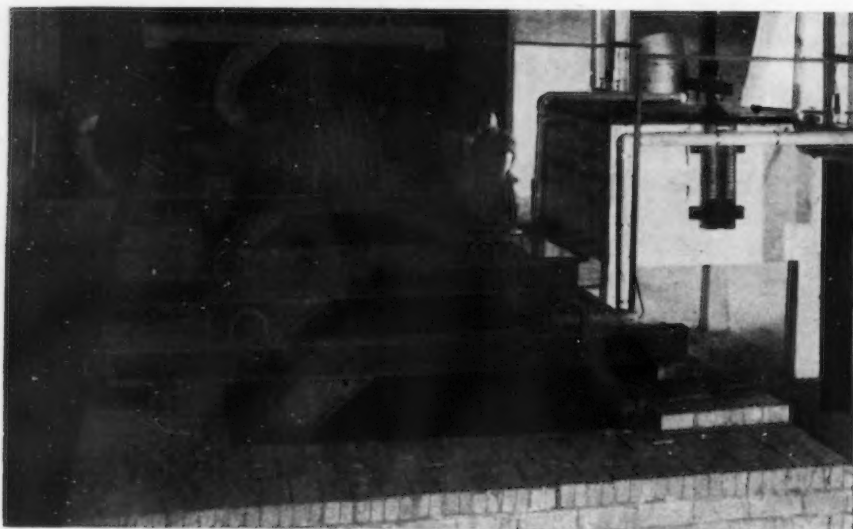
Send us blueprints, sketches or sample of work requiring drilling or boring operations. We will gladly give you detailed recommen-

dations showing exactly what Baker equipment can do for you.

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# ★ BAKER ★

## BASOLIT Pickling Tanks



Pictured here is a three section 35 ft. wire pickling tank installed 1933 in the Rock Falls plant of Russell, Burdsall & Ward Bolt & Nut Co., constructed of brick-veneered concrete shell with inner lining of double acid brick and BASOLIT acid proof cement. BASOLIT is also available in combination with rubber lined steel tanks.

BASOLIT Tanks are wear proof and immune against all commercial acids in steel pickling, including hydrofluoric, and many have been in operation from six to eight years without any cost of maintenance or repair.

### NUKEM PRODUCTS CORPN.

Buffalo, N. Y.

New York

Pittsburgh

Kitchener, Ont.

## STANDARD S.A.E. ALLOY STEELS IN STOCK

For those who prefer standard numbered steels we have

2315	3130	4340	6150
2320	3135	4345	X4130(Aircraft)
4615	3140	4350	4140
4620	3145	6145	4150

For those who wish to take advantage of constant metallurgical improvement and development long before they are incorporated in S.A.E. standards, or where close selection of material for analysis, grain size, control and quality is desired, we offer

ALLOY



GRADES

THE HY-TEN OF TODAY IS THE STANDARD STEEL OF TOMORROW

"A"IX

"B"2

"B"4

"B"43

"A"15

"B"3X

"B"5

"M" Temper

Rounds  
Squares  
Flats

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Warehouses  
CAMBRIDGE  
CLEVELAND  
CHICAGO

**WHEELOCK, LOVEJOY & CO., INC.**

Send for Data Sheets

Warehouses  
DETROIT  
NEWARK  
BUFFALO

quirements of a 56-in. Hot Strip Mill" by F. O. Schnure, Bethlehem Steel, and R. H. Wright, engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh; and "Special Problems of Steel Mill Electrification" by L. A. Umansky, General Electric Co., Schenectady, N. Y.

The inspection trip to Bethlehem Steel Co. plants will wind up the convention on Friday afternoon, April 29.



**C**HARLES D. LOVELAND, whose appointment as sales manager of the New York district by the Truscon Steel Co., Youngstown, was announced in these columns last week.



**B.** W. JOHNSON, who has been appointed New York district sales manager of Allegheny Steel Co., Brackenridge, Pa. Announcement of his promotion was made in these columns last week.



## ..PERSONALS..

GEORGE S. CASE, SR., who has been president since 1929 of the Lamson & Sessions Co., Cleveland, has been elected chairman of the board, succeeding the late John G. Jennings. ROY H. SMITH, executive vice-president of the company, has been elected president.

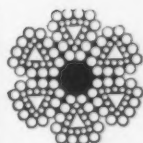
Mr. Smith learned the trade of tool maker in Providence, R. I., and then became designer of automatic machinery and later assistant superintendent of Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y. Later



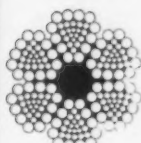
G. S. CASE



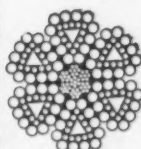
R. H. SMITH



Style B  
Flattened Strand



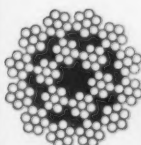
"G"  
Flattened Strand



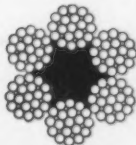
Wire Rope Center



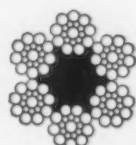
Steel Clad



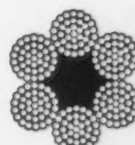
18x7  
Non-Rotating



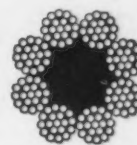
6x19  
Filler Wire



6x19  
Scale



6x37  
Extra Flexible



8x19  
Extra Flexible

### You Can Depend On

#### "HERCULES"\* (Red-Strand) Wire Rope...

There is no guesswork when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. Furnished in a wide variety of constructions so as to be suitable for all purposes—each backed by 81 years of manufacturing experience and close co-operation with users.

#### —PREFORMED—

For maximum efficiency in Preformed Wire Rope, use Preformed "HERCULES". It is available in both Round Strand and Flattened Strand constructions.

Made Only By

### A. LESCHEN & SONS ROPE CO.

Established 1857

5909 KENNERLY AVENUE, ST. LOUIS, MO.

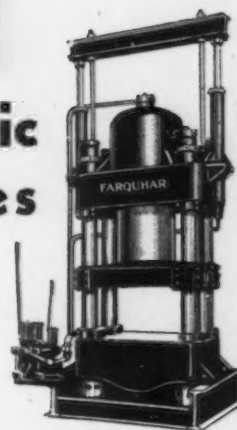
New York . . . 90 West Street  
Chicago . . . 810 W. Washington Blvd.  
Denver . . . 1554 Wazee Street  
\* Reg. U. S. Pat. Off.

San Francisco . . . 520 Fourth Street  
Portland . . . 914 N. W. 14th Avenue  
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## FARQUHAR

### High Speed Hydraulic Production Presses

may be the best way to increase your sales—for they do lower production costs—and improve the quality of the product.



A conference with our Engineering Staff may develop constructive ideas which will help solve your manufacturing problems.

### A. B. FARQUHAR CO.

LIMITED

Box H-62, York, Pa.

he was successively employed as mechanical engineer of the American Bridge Co., and chief draftsman of the automatic machinery department of the Waterbury-Farrell Foundry & Machine Co., Waterbury, Conn. In 1907 he went to Cleveland as general superintendent of the National Screw & Tack Co., which he left in 1914 to organize the Falls Rivet Co., Kent, Ohio, and of which he became treasurer and general manager until its consolidation in 1921 with the Lamson

& Sessions Co. Mr. Smith is a graduate of the Rhode Island School of Design, and Brown University.

♦ ♦ ♦

DAVID O. THOMAS, general manager of the Saginaw Malleable Iron Division of General Motors Corp., at Saginaw, Mich., has relinquished his duties to become vice-president of the Bendix Aviation Corp., South Bend, Ind. W. H. DOERFNER, works manager of the Saginaw Malleable Iron Divi-



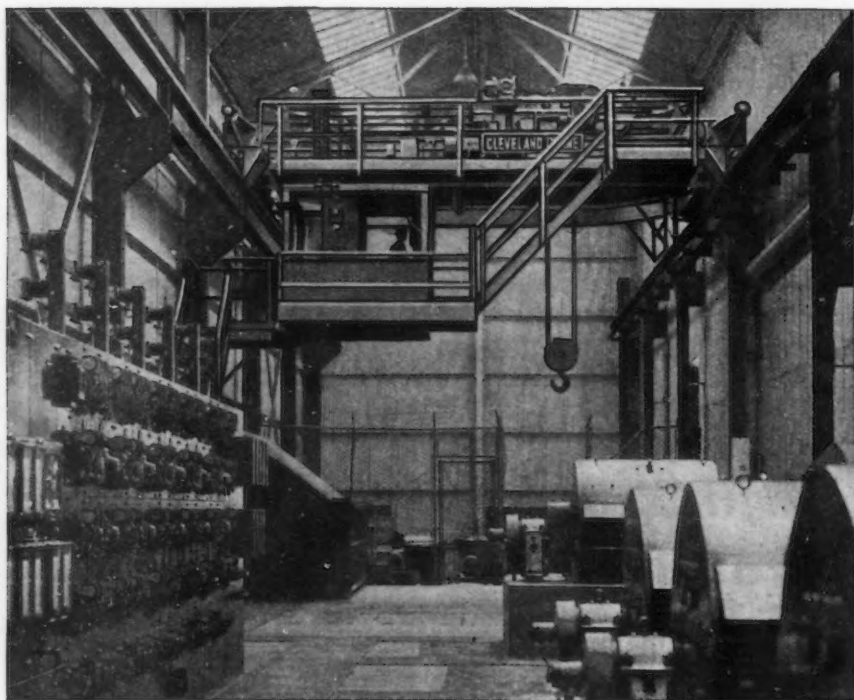
E. R. PALMER



D. O. THOMAS

# **CLEVELAND** **CRANES**

**All Welded for Every Industry**



● A 10 Ton short span Cleveland All Welded Crane in a Steel Mill Power House. It should be Cleveland Cranes, whether your requirements are for continuous hard service or stand by needs.

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**THE CLEVELAND CRANE & ENGINEERING CO**

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NEW YORK • DETROIT

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MATERIALS HANDLING EQUIPMENT

sion, succeeds Mr. Thomas as general manager. The change became effective on April 1. JAMES H. SMITH succeeds Mr. Doerfner as works manager. Coincident with the announcement concerning Mr. Thomas, EDWIN R. PALMER, assistant comptroller of General Motors, has been elected a vice-president of the Bendix Corp., effective April 1.

Mr. Thomas has been in charge of the Saginaw Malleable Iron Division since 1930, and his service with General Motors dates back to 1912. He was born in Johnstown, Ohio, and



H. E. CHURCHILL



E. A. HOFFMAN

left school to enter the steel mills at Lorain, Ohio. His work with General Motors has included important manufacturing and foundry assignments in Muncie, Ind., Detroit and Saginaw.

Mr. Palmer has been with General Motors since 1919, joining the Chevrolet Division in Flint as an accountant. Later, he became resident comptroller and in 1929, was named treasurer of Adam Opel AG, the automotive operations of General Motors in Germany. He became general manager of that company in July, 1936,

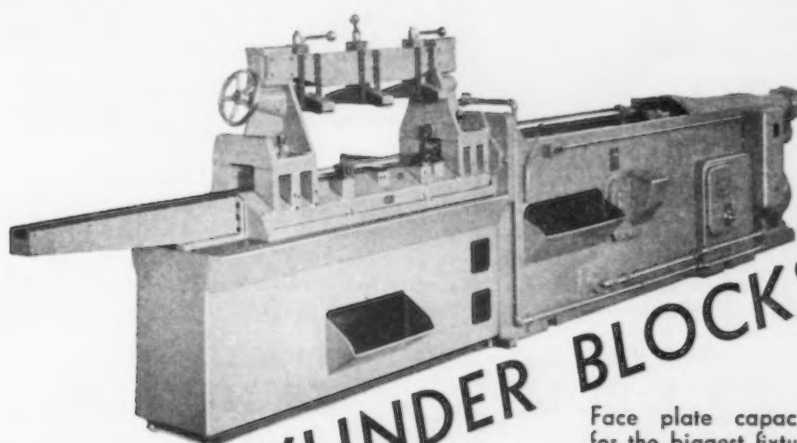
and last July was transferred to Detroit as assistant comptroller of General Motors.

Mr. Doerfner joined the Saginaw Malleable Iron Co. in 1918 as timekeeper and except for the period from 1924 to 1928 when he was constructing a foundry for the Harrison Radiator Division in Lockport, N. Y., he has continued with the same division. After extensive experience in the shops he was made general superintendent, and in 1928 became works manager. Mr. Doerfner was born in Saginaw.

HAROLD E. CHURCHILL has been appointed assistant research engineer for the Studebaker Corp. For the past 12 years Mr. Churchill has been affiliated with Studebaker in its research engineering activities. Prior to that he served in the same capacity with Dodge Brothers Mfg. Co.

♦ ♦ ♦

ELBERT A. HOFFMAN, a member of the Chicago sales department of American Steel & Wire Co., was elected president of the Chicago



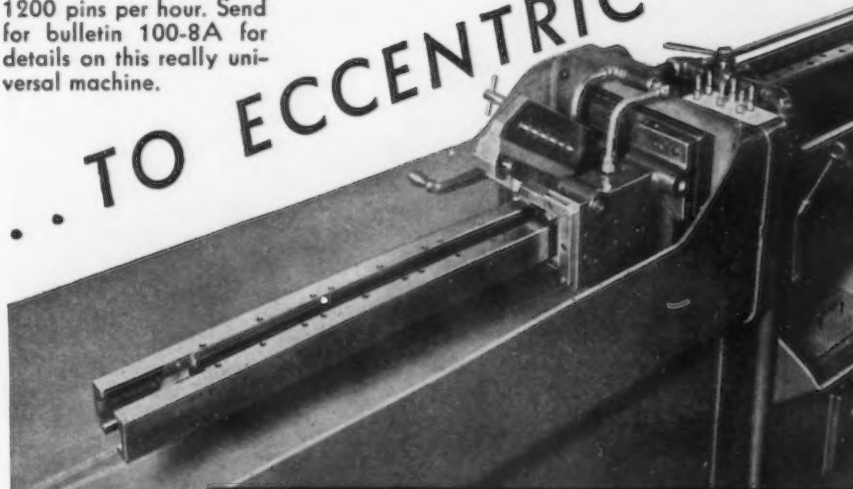
**FROM CYLINDER BLOCKS**

Face plate capacity for the biggest fixture. Variable speed control. Here broaching bearing seats, 60 blocks/hour.

**with COLONIAL UNIVERSAL BROACHING MACHINES**

Multiple small parts broaching—continuous cycle. Four surfaces on 1200 pins per hour. Send for bulletin 100-8A for details on this really universal machine.

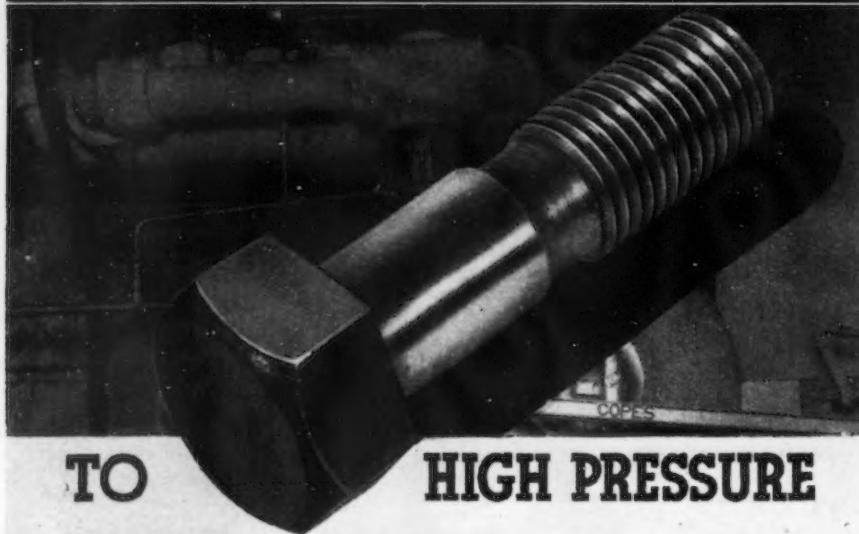
**... TO ECCENTRIC PINS**



**COLONIAL BROACH COMPANY**  
147 Jos. Campau • DETROIT, MICHIGAN



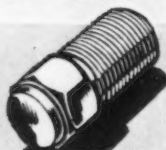
# RESISTANCE



## TO HIGH PRESSURE

**M**ANY thousands of high pressure requirements have been successfully met in the past 25 years by the special alloy boltings designed and produced by Erie's special threading developments, special alloys and *unswerving precision*... When you specify Erie bolting, you are sure of the *extra factor of safety* so necessary in high pressure applications. Present your problem to us now.

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1345 LIBERTY ST.



**& NUT CO.**  
ERIE, PENNSYLVANIA

# MARVEL

**you are paying  
TOO MUCH  
for cutting-off**

Unless you have one or more new heavy-duty, super high speed MARVEL Automatic Hack Saws, you are paying too much for cutting-off. No other machine of comparable accuracy will cut off an equal number of pieces from bar stock in diameters to 10" with such speed, at such low labor cost, power cost, tool cost or with such small chip loss. Far heavier, and all ball-bearing, these MARVEL Automatic Saws Nos. 6A and 9A are built for continuous operation at speeds, feeds and blade tensions impractical for other equipment. They will cut off identical lengths, 10 pieces of 6" round, 160 pieces of 1½" round every hour floor-to-floor, and other sizes proportionally. They cut off squarely and accurately—save stock and machining.

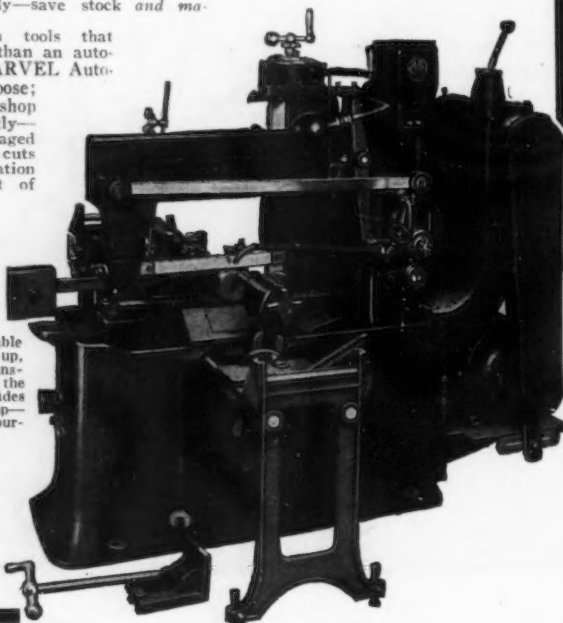
While strictly production tools that require no more attention than an automatic screw machine, MARVEL Automatics are also multi-purpose; will handle all run of the shop sawing easily and efficiently—bar push-up can be disengaged at any point, miscellaneous cuts made, and automatic operation resumed by re-engagement of the bar feed drive.

**MARVEL 6A**  
(Capacity 6"x6")  
**MARVEL 9A**  
(Capacity 10"x10")

Note: These machines are available without automatic Bar push-up, with or without 4-speed transmission. The MARVEL Line, the most complete line built, provides saws exactly suited to each shop—from small low priced general purpose saws to giant hydraulics.

**ARMSTRONG - BLUM  
MFG. CO.**

"The Hack Saw People"  
5749 Bloomingdale Ave.,  
Chicago, U. S. A.



Junior Association of Commerce at a special board meeting last week. Mr. Hoffman received his degree in mechanical engineering from Purdue University in 1925, is a member of Tau Kappa Epsilon fraternity, and has been with the wire company since 1927. He was vice-president of the association last year in charge of commerce and industry, and this year has served as vice-president of the civic affairs division. For the past four years he has been active in the association's affairs and is a former president of its legislative study group known as the Senate.

♦ ♦ ♦

BERTRAM S. STEPHENSON, heretofore vice-president of the Tonawanda Iron Corp., North Tonawanda, N. Y., subsidiary of the American Radiator & Standard Sanitary Corp., New York, has been elected president of the Tonawanda company, succeeding CLARENCE M. WOOLLEY.

♦ ♦ ♦

AXEL MALM has resigned as vice-president of the Wetherill Engineering Co., Conshohocken, Pa., to associate himself with the Norristown Foundry Co., also of Conshohocken. His duties will include engineering, design and sales activities.

♦ ♦ ♦

DOUGLAS F. MINER, manager of the central engineering laboratories and standards of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed George Westinghouse Professor of Engineering at the Carnegie Institute of Technology. Professor Miner, who will assume his new duties on Sept. 1, will act as coordinator for the Westinghouse cooperative engineering plan under which a qualified group of engineering students at Carnegie Tech will take the usual technical college courses, and during the same period will receive shop and engineering experience at the Westinghouse plant.

♦ ♦ ♦

WILLIAM P. MACDONALD, who has been identified with the Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., since 1909, has been appointed district sales manager of the New York territory. He will be assisted by C. F. HUTCHINGS and L. W. KUNZMANN, with offices at 117 Liberty Street, New York.

(CONTINUED ON PAGE 86)

## Kicking the Soap Box From Under the Demagogue

(CONTINUED FROM PAGE 33)

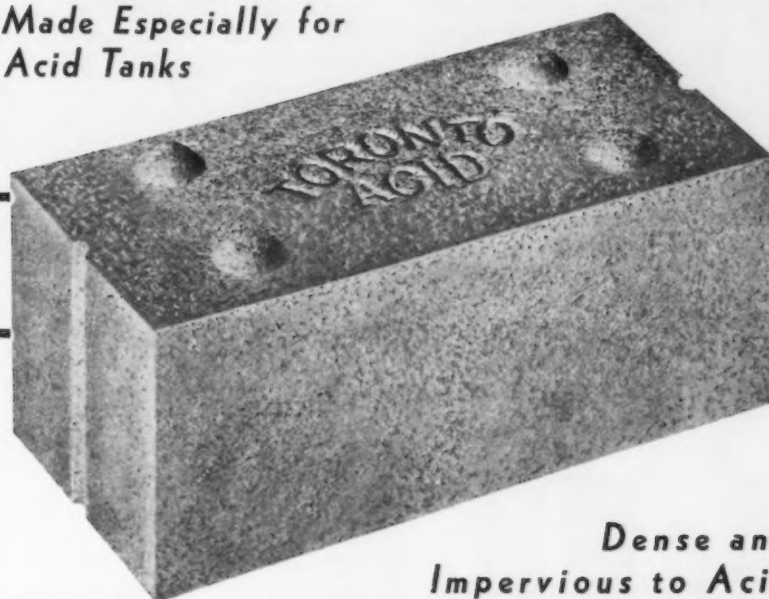
operation that will bring about greater prosperity than the peoples of this country have ever known. The peoples of this country have a right to the truth, and they should all get it.\*

Let me repeat, we have all made mistakes, and many of them. People who do things always make many more mistakes than the people who do nothing. A baby creeps before it walks, and we might as well expect a baby to start right off walking, as to expect men to go through life without making mistakes. It is human to err, and most of us are human.

Nothing has hurt me more during the last few years than to see many of my honorable friends in the business world become objects of slander, and watch them shrivel up, their initiative dulled, and the entire country suffering as a result. Practically all important business executives that I know are men whose first loyalty lies with the solvency of their business, and I have yet to see an executive who did not shrink at the thought of reducing payrolls. Every business man knows that such action reduces buying power, and there are few business men who have any desire to do that. Several of the most important business men in this country whom I have the honor of knowing intimately are men whose first thought is toward the welfare of those on the company payroll. There may be, and undoubtedly are, business men who do not have that trait of character, but they are a very small minority. I think we can say the same of labor—many of the leaders I have met are fine, reasonable minded men. That is not the problem. The problem is for the fair-thinking men of all groups to get together, throw away their hammers, establish contacts where the best in all groups can be brought to the surface, and through cooperative action give the greatest possible service to the peoples of this country. After all, it is the consumer that makes it possible for business to sell goods, and for labor to produce goods. It is the consumer that we must deal with in the long-run—no matter how strong we build labor organizations, manufacturers organizations or farm groups, the fact still remains that when the public thinks prices are too high, they go on a strike—a strike

## TORONTO ACID BRICK

Made Especially for  
Acid Tanks



*Dense and  
Impervious to Acid*

### FOR USE WITH BASOLIT CEMENT

Toronto Acid Brick are designed for use with Basolit, the acid-proof cement joint. Accurate spacing buttons and end grooves insure uniform self-anchoring joints at low labor costs for laying up tank walls and

floors. Precisely moulded, repressed and degassed, Toronto Acid Brick are made in stock and special shapes. Send for samples and further information.

**THE KEAGLER BRICK COMPANY**  
STEUBENVILLE, OHIO

Fire Clay, Acid Resistant Brick, Fire Clay Mill Brick, Pickling Tank Linings, Acid Proof Construction, Paving Brick, Paving Block, Chimney Stack Brick.

# LEE

## Quality Springs

ALL SHAPES • ALL SIZES • ALL MATERIALS



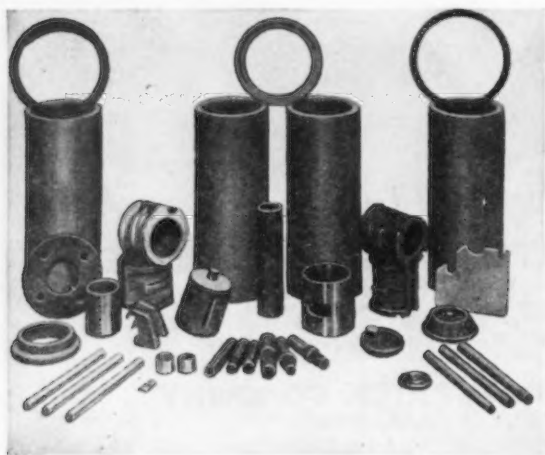
**LEE SPRING COMPANY, Inc.**  
30 MAIN STREET      BROOKLYN, N.Y.





much more effective than any labor has ever engaged in, or any activity that the manufacturer or the farmer has ever taken. So, in the long-run, the people themselves are the balance-wheel—the people themselves elect all public officials and, therefore, if we are to expect understanding and co-operation it is up to all of us to see that all men and women are placed in a position where they have the truth on which to guide their judgment,

because if their judgment is wrong we all suffer, and if their judgment is right, we all prosper—so—let's quit throwing brickbats and begin establishing truth, and all business men, civic, patriotic, fraternal and labor leaders should immediately shoulder this responsibility—give freely of their time to bring about factual understanding necessary to perpetuate democratic Government and National prosperity.



## Nitri-cast-iron

### *the Answer to Abrasion*

Nitri-cast-iron, a modern wonder metal, is amazing both its users and its manufacturer with its phenomenal success in widely varying applications. Cast in sand or centrifugally cast, and then heat treated and nitrided, this metal assumes great hardness and an almost incredible resistance to sliding wear. It is also highly resistant to corrosion and retains its extreme hardness at sustained temperatures as high as 1000° F.

A few examples of its remarkably successful application are shown

above. These include sleeves for internal combustion engine cylinders; valve guides; piston rings; pump cylinder liners for water, oil, air, steam or refrigerants; bushings; plungers; cylinder liners for zinc die casting machines; valve bodies and seats; wire drawing capstans; and other parts subjected to extreme wear.

Nitri-cast-iron is effecting great savings for many users. It may save for you too. For complete details, including technical data, write for the Nitri-cast-iron book today.



**THE FORGING AND CASTING CORPORATION**

FERNDALE (DETROIT) MICHIGAN

COMPOSITE STEEL DIES - TOOL STEEL CAST TO SHAPE  
TOOL AND ALLOY STEEL FORGINGS - NITRI-CAST-IRON

## Foundrymen Argue Cupola Problems

(CONTINUED FROM PAGE 43)

clearance is necessary and the cupola inside diameter may be 42 in.

### The Acipco Charger

By D. GULDBERG

*American Cast Iron Pipe Co.*

The Acipco cupola charger was designed and patented by the American Cast Iron Pipe Co. in 1926. In that year the first commercial mono-cast pipe plant was built which included a battery of seven 72 in. cupolas.

For a melting plant of this size the type of charging machines to be used and the method of conveying the charges from the storage bins to cupola in the most economical manner were of prime importance.

It was decided that to handle the raw material in a charging box would be the best method, the box to be raised from the iron yard level by means of an electric overhead high speed crane, and placed in a charging machine so designed that the crane operator could charge the cupola without leaving the cage.

An experimental machine was designed and built, which, after considerable experimenting took the form it now has, and with only a few minor changes has been in successful operation for 12 years.

The charging machine proper consists of the following parts:

A heavy structural steel base with "A" frames on both sides securely bolted to the charging platform; two track rails fastened to the base with rails inclining toward the charging door of the cupola; a carriage mounted on flange wheels running on the rails and a tilting frame pivoted, near the center, to the front end of carriage. At the rear end of the frame are attached two guide rollers that engage with guide rails. The top of tilting frame is fastened together with transverse rails which serve as a seat for the charging box and prevent it from sliding off.

Fastened to each side plate on the "A" frame are three L-shaped guide rails which control the tilting of the frame and charging box. At the front end of the middle rail is pivoted a switch pawl, its free end resting on the bottom guide.

At the top of the side frame two guard plates are fastened which act



as a guide when the charging box is being lowered into the machine and also protect the guide rails from damage.

### Operation

The operation of the charger shown in Fig. 3 is entirely controlled by the crane operator. When charging the box is spotted over the charging machine, ready to be lowered and the crane cage is in such a position that the crane operator has a full view of the charger and can see through the charging door to the inside of the cupola.

By operating a valve, the pressure underneath the plunger of the hydraulic cylinder is gradually relieved and controlled by the crane operator and the carriage with tilting frame and box is started by gravity on its way toward charging door of the cupola. The guide rollers on the tilting frame will follow the lower rail, engage and lift the pawls and pass beyond. By that time the front wheels on the carriage will have reached the wheel stops, and the charging box is now inside cupola ready to be unloaded.

The crane operator now opens the valve and pressure is applied to the hydraulic cylinder starting the carriage on its return trip. This concludes the cycle of operation.

Although the angle of repose and friction between box and pig iron, scrap or coke varies, the charger will distribute all of these materials in an even layer.

This is accomplished by the crane operator varying the speed of withdrawal and by imparting a jarring motion to the tilting frame and box by applying or relieving pressure in the hydraulic cylinder.

## "Graphic Routes to Greater Profits"

UNDER the above title, John W. Esterline has just published 239 case studies of the use of graphic instruments in the determination of industrial management problems relating to power, men, machines, processes and products.

In a fabrikoid-bound volume of some 320 pages, profusely illustrated, Mr. Esterline has crisply reported the solution, by means of graphic instruments, of actual cases throughout

American industry involving the inefficient use of power generation, transmission, distribution and application to driven machines, of the inefficient application of labor to processes, of the measuring of productive work on the part of employees, of the inspection and testing of products of the more accurate determination of costs, and of the usable methods of correlating the use of power with the performance of labor.

The book is the outcome of a life-

time of experience in graphic methods of approaching the management problems of industry, and is an undoubted contribution to the science of management engineering. The peculiar patois of the technician has been avoided throughout; as a consequence it is as readable as a popular novel. The industrial executive charged with keeping production costs in line will find it a mine of useful ideas.

Published by the Esterline-Angus Co., Indianapolis, Ind. Price \$3.00.



**YOU**  
*should*  
**SPECIFY**  
**ROPER**  
*Rotary Pumps*

EQUAL SIZE GEARS OPERATE AT SAME SPEED



**\*NOW USED BY**  
Anaconda, Armco, American, Bethlehem, Ford, Republic and others.  
Write for complete list.

**\*DIRECT DRIVE**  
is quieter—occupies less floor space.

**\*LARGE SLEEVE BEARINGS**  
are quiet, automatically lubricated and can stand abuse. We also build ball bearing pumps.

**\*HERRINGBONE GEARS**  
accurately generated for maximum mechanical and volumetric efficiency.

**\*1 to 700 G.P.M.**  
a size and type for every need.

The basic design of all Roper Rotary Pumps is the simplest yet conceived (only 2 moving parts) . . . resulting from 80 years of engineering, experimentation and experience.

Roper Pumps have earned their spurs for dependable, efficient, trouble-free service. Specify ROPER wherever good pumps are needed.

**WRITE FOR COMPLETE INFORMATION**

**GEO. D. ROPER CORPORATION**      **ROCKFORD, ILLINOIS**  
*Offices: PITTSBURGH and Other Principal Cities*



**NO HANDICAP to TOWMOTORS**

## YOUR MATERIAL HANDLING

problems will not be fully solved unless your lift trucks have hydraulic smoothness of operation with precise control for exact placing. Those features have helped straight gas powered TOWMOTORS build themselves a reputation for lower cost per year as well as per ton moved. Perhaps they can do the same for you.

**TOWMOTOR COMPANY, 1231 E. 152nd St., Cleveland, Ohio**

New York Office: 96 Liberty Street—Phone: Barclay 7-3050

*More and Cleaner  
Pipe Cuts  
with the RIGID  
Cutter* per cutter blade

● Your experience with pipe tools makes it easy for you to see at once why this patented RIGID cutter saves you money on cutter wheels and gives you far cleaner cuts.



For the RIGID wheel has a thin blade coined from special rolled alloy tool steel, hammered and heat-treated to give it extra guls, then assembled in a solid hub. It rolls right through any pipe, quickly, easily, leaving practically no burr. Far more cuts per wheel, saves you bother and expense of replacement.

Cutter housing reinforced, strong and true-cutting. A tool you enjoy owning and using. Hundreds of thousands in use. Try one at your jobbers. For better cutting and economy, buy the RIGID Cutter.



**The Ridge Tool Co.**

**Elyria, Ohio**

**RIGID PIPE TOOLS**

## ..PERSONALS..

(CONTINUED FROM PAGE 82)

VERDIE A. DODDS, who has been associated with the Brown-Wales Co., Boston, for a number of years, has been elected vice-president in charge of sales. JOHN G. FOWLER has been made vice-president in charge of the Lewiston, Me., branch. He has been



V. A. DODDS

identified with the company for many years.

♦ ♦ ♦

GEORGE S. DAVISON, president of Davison Coke & Iron Co., Pittsburgh, was honored at a testimonial dinner given by the Pittsburgh chapter of the American Society of Civil Engineers at the William Penn Hotel, March 31. Mr. Davison has been in engineering work in Pittsburgh for 62 years. He is a past-president of the American Society of Civil Engineers and at a recent meeting of the society in New York was made an honorary member.

♦ ♦ ♦

WALLACE D. WALKER has been elected president of Talon, Inc., Meadville, Pa. Mr. Walker has been with the company since 1914 and succeeds his father, the late Colonel Lewis Walker, founder and first head of the



company. He started as a salesman, for 15 years was in charge of the New York sales office, was made vice-president and controller in 1933 and in 1937 was named senior executive officer of the corporation.

Other officers elected were: T. F. SOLES, vice-president; W. C. ARTHUR, vice-president and secretary; S. M. KINNEY, vice-president; P. K. POULTON, treasurer; R. S. KELLEY, assistant secretary, and T. L. CHISHOLM,



J. G. FOWLER

assistant secretary. Members of the board of directors were reelected by the stockholders at their annual meeting.

♦ ♦ ♦

MAX W. BABB, president of the Allis-Chalmers Mfg. Co., Milwaukee, has been elected a director of Cutler-Hammer, Inc., Milwaukee, manufacturer of electrical controls. He succeeds T. JOHNSON WARD, of Philadelphia, who has retired.

♦ ♦ ♦

JAMES C. MCNETT, Detroit representative for Strong, Carlisle & Hammond Co., Cleveland, during the past five years, has been placed in charge of the Toledo, Ohio, district succeeding the late Frank B. Hoffstetter.

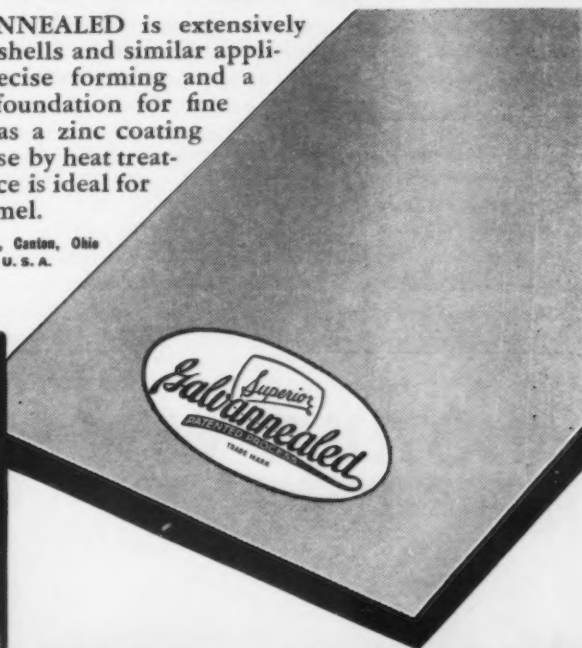
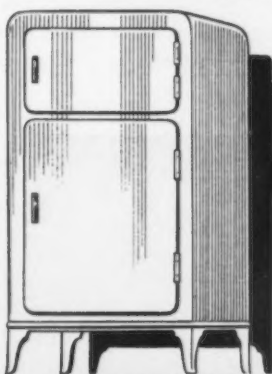
♦ ♦ ♦

LYLE C. HARVEY, formerly vice-president of the Bryant Heater Co., Cleveland, has been elected president, succeeding HENRY N. MALLON, of Bradford, Pa., who becomes chairman

## For PRECISE FORMING AND FINE FINISHES

SUPERIOR GALVANNEALED is extensively used for refrigerator shells and similar applications requiring precise forming and a highly rust-resistant foundation for fine finishes. This sheet has a zinc coating alloyed to the steel base by heat treatment. Its velvety surface is ideal for paint, lacquer, or enamel.

THE SUPERIOR SHEET STEEL CO., Canton, Ohio  
Division of Continental Steel Corp., U. S. A.



# SUPERIOR

## OPEN HEARTH STEEL SHEETS

Superior Galvannealed "Super-Metal" Special Coated	Galvanized Sheets Galvanized Roofing Long Ternes	Hot Rolled Annealed Pickled, Deoxidized Cold Rolled
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## Your Stop Watch Will Tell the Story!



HERE'S a metal cutting saw that combines speed with accuracy. Under competitive tests Wells Band Saws have reduced sawing time

from 30 to 50%—have, through accuracy, permitted closer working tolerances, reducing machining time to a minimum.

And that is only two of the Wells features. Design of saw permits cutting material to practically any angle. 3 speed control assures proper saw speed for various types of metals. Portability allows placement at any location in a plant where a metal cutting saw is needed.

Let Wells demonstrate this saw to you in your own plant without obligation.

Write for further details.

• Saw it the WELLS WAY •

**WELLS MFG. CORP.** Three Rivers, Michigan

<b>No. 8 Size</b> 8" diameter round or 8" x 16" flat	<b>No. 5 Size</b> 5" diameter round or 5" x 10" flat
---	---



of the executive committee. GORDON RIELEY, previously sales manager, has been promoted to vice-president in charge of sales.

♦ ♦ ♦

ADOLPH FRANKEL has been appointed merchandising manager of the Westinghouse Lamp Division, Westinghouse Electric & Mfg. Co., East Pittsburgh. Mr. Frankel's temporary headquarters will be at 10 High Street, Boston, where he will establish the first regional field office for han-

dling the distribution and marketing of the new Westinghouse sterilamp. He has been connected with the Westinghouse company since 1917.

♦ ♦ ♦

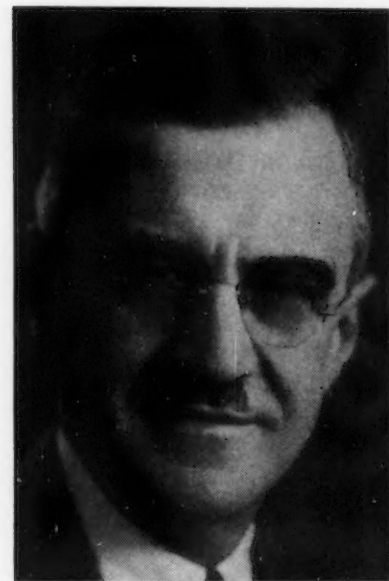
JOHN M. WILSON, president, National Supply Co., Pittsburgh, and FRED T. FRUIT, attorney, of Sharon, have been made directors of the headquarters will be at 10 High Street, Boston, where he will establish the first regional field office for han-

HAROLD C. HICKOCK has been appointed district manager of the Westinghouse Electric Elevator Co. with offices in Pittsburgh. Mr. Hickock has been associated with Westinghouse since 1916. He is a graduate of the Worcester Polytechnic Institute and

## Portraits of New Jones & Laughlin



**R**ALPH T. ROWLES, who has been promoted to assistant general manager of sales of Jones & Laughlin Steel Corp., as announced in The Iron Age of March 31, page 79.



**A**RTHUR A. WAGNER, who becomes manager of hot-rolled sales of Jones & Laughlin.

## ANOTHER WAY



## Super- Service Radials

**Your larger jobs,** like the one shown here, might at first glance seem to require a fairly large radial drill, but a careful study of the features and productive capacity of the new High Speed SUPER SERVICE Radial may help you to visualize a set-up like this—less costly, more efficient.

You can save first cost, direct labor, floor space, interest and depreciation charges, and get more work per dollar with this new radial. It's proved by the experience in our own plant and in more than 300 others. May we send you complete details? Write for Bulletin R-21A.

The Cincinnati Bickford Tool Co.  
Oakley, Cincinnati, Ohio

# CINCINNATI BICKFORD

was associated with various engineering divisions in East Pittsburgh prior to joining the elevator company. He went to Pittsburgh from the headquarters sales division of the elevator company located in Jersey City, N. J., prior to which time he was New Eng-

## Appointees of Steel Corp.



**JOHN O'H. ANDERSON**, recently assistant manager of New York office of Jones & Laughlin, has been appointed manager of tubular products sales.



**F. B. KITTREDGE** has been appointed assistant district sales manager for Jones & Laughlin Steel Corp. with headquarters in Boston.

land manager with offices in Boston. He succeeds **WILLIAM H. PATTERSON**, who has been transferred to the headquarters staff of the company in Jersey City.

♦ ♦ ♦

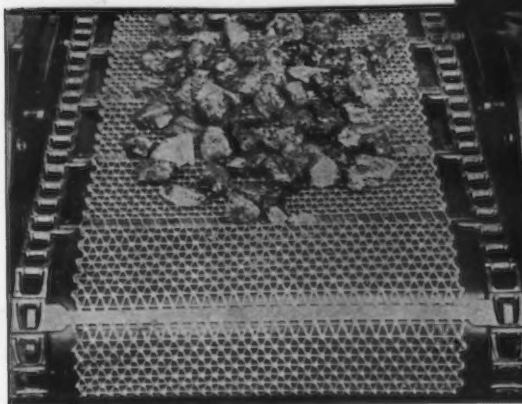
**BEN W. DIMEND**, recently with the Federal Machinery Sales Co., Chicago, and before that direct factory representative for the Warner & Swasey Co. in California, has become associated with the Jackson-Fotsch Co., Chicago, which represents the

Kearney & Trecker Co., John Bath & Co., Eclipse Counterbore Co., and other machine tool builders. Mr. Dimend has been identified with the machine tool trade for more than 20 years.

♦ ♦ ♦

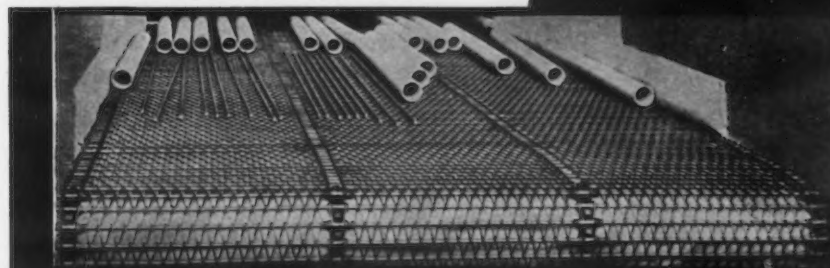
**R. D. HEFLIN** and **R. H. BRUCE** have been placed in charge of sales in eastern New York, eastern Pennsylvania and all of New Jersey, Delaware and Maryland, by the Gisholt Machine Co., Madison, Wis. They will

# It Pays to use CAMBRIDGE CHAIN & SPROCKET DRIVEN MESH BELTS



Cambridge Chain and Sprocket Driven mesh belts are available in all types of roller chain, pintle chain and detachable chain.

*Put your  
Conveyor Belt  
Problems up to  
a skilled  
Cambridge  
Engineer*

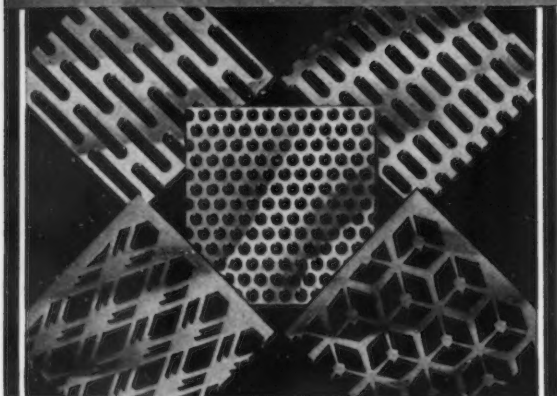


**CAMBRIDGE WIRE CLOTH CO.**  
CAMBRIDGE, MARYLAND

Boston - New York - Baltimore - Pittsburgh - Detroit - Chicago - San Francisco - New Orleans



## PERFORATED METALS



• The H & K line embraces all the standard and many special and exclusive shapes and sizes of perforations. We have booklets and catalogs covering different groups, which we will gladly send, if you will give us a line regarding your requirements.

Great care is exercised that our customers receive the best in perforated metal.

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**INDUSTRIAL  
ORNAMENTAL**

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**ANY  
METAL**

**ANY  
PERFORATION**  
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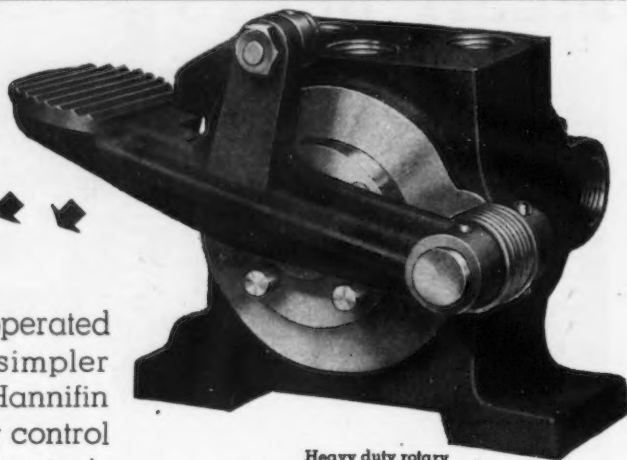
*The*  
**Harrington & King**  
PERFORATING CO.

5657 FILLMORE ST., CHICAGO

114 LIBERTY ST., NEW YORK

♦ **FOOT  
WORK**  
*is faster* ♦ ♦

Control of air operated equipment is simpler and faster with Hannifin foot operated air control valves. The operator's hands are free for other work. Simple, dependable disc-type valve design gives positive control and prevents leakage. No packing and no packing maintenance troubles.



Heavy duty rotary ratchet valve, one pressure operates the cylinder, second pressure reverses the cylinder.

Made in 3-way and 4-way types, hand and foot operated, manifold, spring return, electric and special models. Write for valve Bulletin.

**HANNIFIN MANUFACTURING COMPANY**  
821-831 South Kolmar Avenue • Chicago, Illinois

Engineers • Designers • Manufacturers • Pneumatic and Hydraulic Production Tool Equipment

**HANNIFIN** *"Packless"* **VALVES**  
AIR CONTROL

## Portraits of New Jones & Laughlin



**WILLIAM K. BREEZE** (left) and Hughart R. Laughlin (right) have been appointed assistant managers of Jones & Laughlin's New York office.



**EDWARD J. DICKSON** has been appointed assistant manager of tubular products sales by Jones & Laughlin.

make their headquarters at 1060 Broad Street, Newark. Western New York, including the Syracuse, Rochester and Buffalo areas, will be in charge of **GLENN M. ROGERS**, with headquarters at 7 Maple Street, Pittsford, N. Y. **D. A. WALTERS**, formerly of the Ohio territory, has been transferred to the Detroit office, where he will be asso-



## Appointees of Steel Corp.



H. R. LAUGHLIN



**EDWARD H. HUGHES** is Jones & Laughlin's new district sales manager at St. Louis.

ciated with U. S. JAMES. The State of Indiana, south of and including Muncie, will be covered by the Dayton office, 1506 Mutual Home Building, in charge of E. B. VERNER. HAROLD EARL, formerly of the Gisholt service staff, has been transferred to the Chicago area sales staff, under C. J. BAXTER and will cover western

**M.D. Hubbard Spring Company**  
M. D. HUBBARD, Pres. J. A. HUBBARD, Secy.  
750 CENTRAL AVE., PONTIAC, MICH.

**SPRINGS  
STAMPINGS  
WIRE SHAPES  
EXPANSION PLUGS  
WASHERS  
COTTERS**

**GIBSON-SPRINGS**  
in all types ... and sizes

... ranging from those made of heavy bar or rod, hot coiled—to tiny springs made from fine piano wire. In all GIBSON Springs, an elaborate system of scientific control insures accuracy to specifications. Only a large well-equipped plant can turn out such quality springs at ordinary prices. Design engineering service on request.

**WILLIAM D. GIBSON CO.**  
Div. of Asso. Spring Corp. 1800 Clybourn Ave., Chicago, Ill.

May we quote on your requirements for  
**SPRINGS  
SMALL STAMPINGS  
WIRE FORMS?**

Illinois, Iowa and the St. Louis district.

♦ ♦ ♦

L. W. MARTIN, who became associated with the American Car & Foundry Co. in 1902, after graduating from the State University of Kentucky, has been made district sales manager, with headquarters at St. Louis.

♦ ♦ ♦

D. W. HIRTLE, heretofore vice-president of the Burgess Battery Co., Chicago, has been elected president, and

DR. C. F. BURGESS, chairman of the board.

♦ ♦ ♦

ISAAC TRIPP, JR. has been made vice-president in charge of sales of the Oak Chemical Products Co., Bechtelsville, Pa. ALFRED G. WILBY remains in charge of the chemical laboratory and of production.

♦ ♦ ♦

E. T. STANNARD has been elected to the board of directors of the Johns-Manville Corp., New York, succeed-

## Recent Appointees



E. A. TANNER  
President



LOUIS KUEHN  
Chairman of the Board



for all your

## BEARING BRONZE requirements

Here is the most complete catalogue on BEARING BRONZE ever published. Sixty-four pages—packed with useful, authoritative data and information for every user of bearings.

Within its pages you will find, described in detail, the Johnson line of stock bronze bearings. This represents not only the largest range of sizes in every type but also the highest quality bearing bronze available.

We offer you this book absolutely free. Simply write us—TODAY—and a copy of CATALOGUE 380 will go forward by return mail—without obligation.

### CONTENTS

General Purpose Bearings, Johnson UNIVERSAL Bronze Bars, Electric Motor Bearings, Johnson Graphited Bronze, Babbitt-Lead Base and Tin Base, Hexagon Bar Bronze, Oil Grooving, Alloys, etc.

## JOHNSON BRONZE

505 S. MILL STREET · NEW CASTLE, PA.

**Sleeve** BEARING HEADQUARTERS

ing ALFRED P. SLOAN, JR. Both Mr. Sloan and CLARENCE M. WOOLLEY requested that their names not be submitted for reelection as directors because of the pressure of other duties.

♦ ♦ ♦

JOEL CLASTER, of Luria Brothers & Co., Inc., Philadelphia, has been appointed chairman of the finance committee of the Institute of Scrap Iron and Steel, New York.

## of Milcor Steel Co.



**E. L. LIPMAN**  
Secretary-treasurer

H. LODGE ROBERTSON, writer and lecturer on the graphic arts, has been appointed Western manager of Designers for Industry, Inc., New York.



WALLACE H. ROWE, JR., has been appointed district sales manager of the Los Angeles office of Pittsburgh Steel Co., effective April 1. Mr. Rowe, who is the son of the late Wallace H. Rowe, one of the founders of Pittsburgh Steel Co. and its first president, has for a number of years been a sales representative for the company with headquarters at Pittsburgh. In his new capacity he will have charge of the Pacific Coast sales activities for all of the products of Pittsburgh Steel Co. The Los Angeles office is in the Richfield Building.



GEORGE W. BALKWILL, a former partner of the Cleveland Frog & Crossing Co., Cleveland, has been elected board chairman, following the recent conversion of the company from a partnership to a corporation. The change resulted from the death of George C. Lucas, senior partner and founder of the firm, established in 1883. L. G. PARKER, who has been with the partnership since 1910, is now president and treasurer of the company. The list of officers and directors includes three newcomers: L. E. CONNELLY, Cleveland, who will

be vice-president and general manager; HENRY M. LUCAS, president, Lucas Machine Tool Co., Cleveland, and brother of the former senior partner; and CLYDE M. WHITE, attorney. L. C. SPIETH is secretary. The company thus continues under virtually the same ownership and with no changes in the operating staff. It manufactures railroad equipment.



FRED P. MCBERTY retired April 1 from active service as executive man-

ager of the Federal Machine & Welder Co., Warren, Ohio, of which he was the founder. He still retains his title of chairman of the board. Mr. MCBerty was honored at a testimonial dinner March 31 by 55 of the company's older employees.



CHARLES L. MCHENRY has resigned as treasurer of the H. K. Porter Co., Pittsburgh. Mr. McHenry was associated with the company in various capacities for the past 52 years.



## Welded BOX GIRDER CRANES

● In this type of crane the rugged box section girder is formed by welding together the flanges of two wide flange I-Beams which are diaphragmed at regular intervals through their entire length.

Capacities—Welded Girder—1 to 15 tons.

Riveted Girder—up to 450 tons.

Standard Shepard Niles Crane Trolleys with their balanced drive gearing, oil bath lubrication, compact design, interchangeable unit construction are available for welded box girder cranes.



356 Schuyler Avenue . . . MONTAUR FALLS, N. Y.



## Modernizing a Malleable Foundry

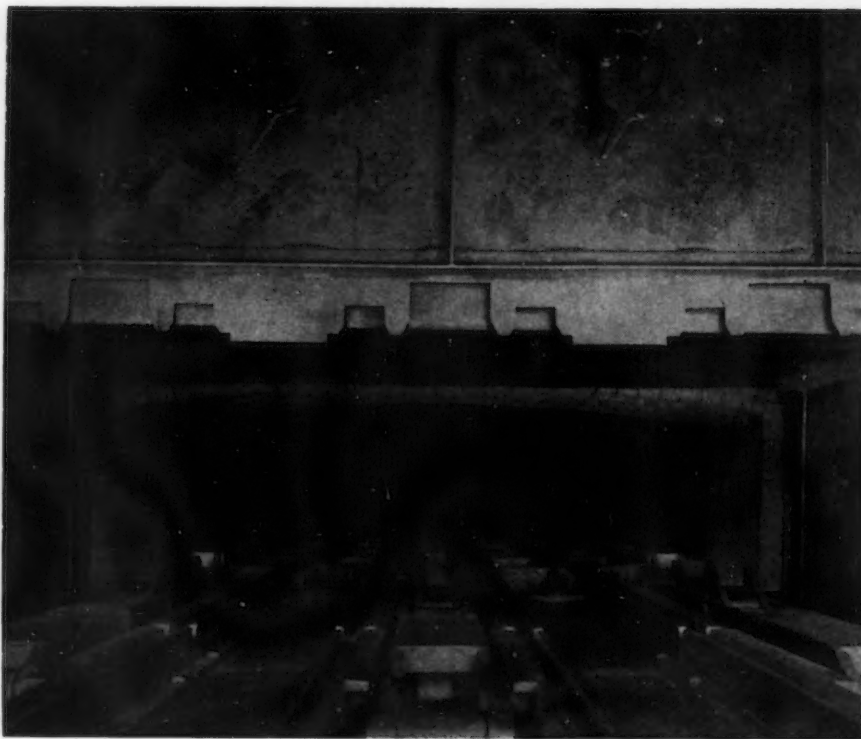
(CONTINUED FROM PAGE 39)

one time. The trays are two ft. square and the net loading per tray is approximately 500 lb. Weight of the alloy tray, including the six rollers, is 106 lb.

For the dumping of castings, at the discharge end of the furnace, there is provided a fabricated car to receive each tray. This car is provided with a tilting top for dumping the castings and transferring empty box to a return conveyor running alongside the furnace back to the charging end. At the discharge end of the furnace, the conveyor is built higher from the floor level, so that the tray tends to roll back by gravity to the charging end.

A mechanical lock is provided at each end of the furnace to prevent the opening of both the inner and outer vestibule doors at one time.

The loaded trays are pushed through the furnace by means of a mechanical pusher mechanism pushing all three rows at the same time. The



INTERIOR view of furnace. Mechanical pusher heads are shown at the side. Top radiant tubes may be discerned. Similar tubes are below the work. The rollers, or wheels, which are fastened to the bottom of the trays carrying the work, run on the alloy channels which are shown. The channels are supported in refractory tile.

APPRECIATED BY THE ASSEMBLY DEPT.

*Boy, am I glad they switched to Clark Bolts! They are a lot easier on my hands—no ragged edges, burrs or rough finish—and I can make a lot better time with them because of their clean, perfectly gauged threads.*



*You're telling me!*

# CLARK BOLTS

WRITE FOR CATALOG

CLARK BROS BOLT CO.

MILLDALE, CONN.

pusher advances all three rows of trays one tray length per push and then returns to the original starting position. The pusher heads are of the disappearing type so as to advance the trays in stages through the vestibule into the furnace as required.

The pull-out mechanism consists of hand-operated levers at the discharge end, arranged so as to enable the operator to pull out the last tray on each individual row into the discharge vestibule. Limit switches assure that at least one tray length of space on each row inside of the inner door is vacant before the pusher mechanism can operate.

### Sharon Steel's Bookings Up in March, Roemer Says

SHARON STEEL HOOP CO. operations averaged 35 per cent during the first quarter of 1938 and Pittsburgh Steel Co. 41 per cent for the same period, Henry A. Roemer, president of both companies, told shareholders at their annual meeting. March bookings were slightly ahead of February. Sharon Steel, according to Mr. Roemer, "just about broke even" with the exception of depreciation charges, for the first three months of 1938.

## COMING CONVENTIONS

April 8—Management conference, under sponsorship of Society for the Advancement of Management, American Society of Mechanical Engineers, Iowa Manufacturers Association and University of Iowa. Meetings will be held at the University of Iowa, Iowa City, Iowa.

April 20 to 22—American Institute of Mining and Metallurgical Engineers, open-hearth steel conference and meeting of committee on blast furnace and raw materials, Statler Hotel, Buffalo. Committee chairmen are L. F. Reinartz, American Rolling Mill Co., Middletown, Ohio, and R. H. Sweetser, 17 Battery Place, New York.

April 25 to 26—American Zinc Institute, Hotel Statler, St. Louis. E. V. Gent, 60 East 42nd Street, New York, is secretary. Meetings of the Galvanizers Committee will be held in conjunction with the institute's meetings.

April 25 to 27—American Gear Manufacturers Association, General Brock Hotel, Niagara Falls, Canada. J. C. McQuilston, secretary, Penn-Lincoln Hotel, Wilkinsburg, Pa.

April 28 to 29—Concrete Reinforcing Steel Institute, Homestead, Hot Springs, Va. Secretary of the institute is Mark Beman, 201 North Wells Street, Chicago.

April 28 to 29—Association of Iron and Steel Engineers, Lord Baltimore Hotel, Baltimore. L. F. Coffin, Bethlehem Steel Co., Sparrows Point, Md., is general chairman of the program committee.

May 3 to 4—American Steel Warehouse Association, Inc., Waldorf-Astoria Hotel, New York. W. S. Duxsey, 422 Terminal Tower, Cleveland, secretary.

May 14 to 19—American Foundrymen's Association, annual convention, Cleveland. Secretary, D. M. Avey, 222 W. Adams Street, Chicago.

May 23 to 24—Associated Machine Tool Dealers, Dearborn, Inn, Dearborn, Mich. Secretary of the association is T. A. Fernley, Jr., 505 Arch Street, Philadelphia.

May 26—American Iron and Steel Institute, Waldorf-Astoria Hotel, New York. Walter S. Tower, 350 Fifth Avenue, New York, executive-secretary.

June 12 to 17—Society of Automotive Engineers, Greenbrier Hotel, White Sulphur Springs, W. Va. John A. C. Warner, secretary and general manager, 29 West 39th Street, New York.

June 27 to July 1—Annual meeting American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City. N. J. C. L. Warwick, 260 South Broad Street, Philadelphia, secretary.

## RAILROAD BUYING

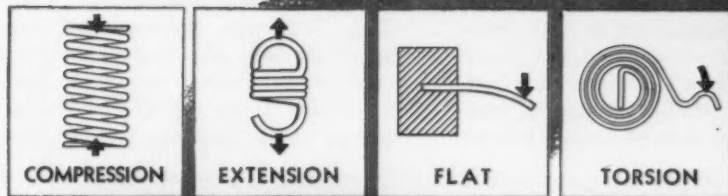
Interborough Rapid Transit Co., New York, has ordered 50 car bodies and trucks from St. Louis Car Co.

### RAILS AND TRACK SUPPLIES

Central of New Jersey has ordered 2500 tons of rails and track accessories from Bethlehem Steel Co.

# B·G·R

helps you to get  
the right **SPRING ACTION**



**S**PRING ACTION that is designed especially to meet the demands of your mechanism will give the best result in performance and length of service.

It will pay you to consult with B-G-R spring engineers on the space to allow, the kind of metal to use, and the size of spring desirable for the load involved.

Take the B-G-R short-cut towards minimizing your experimental time and expense. And when the time comes to produce the order, the complete facilities of two plants are at your disposal, for continuous large production . . . or for very small orders.

## BARNES-GIBSON-RAYMOND

DETROIT PLANT DIVISION OF ASSOCIATED SPRING CORP. COOK PLANT  
DETROIT, MICHIGAN ← TWO PLANTS → ANN ARBOR, MICHIGAN



## HOISTS *for every purpose*

**BUILT TO  
ONE  
HIGH STANDARD**

**H**ERE is a compact hoist with a 240 foot lift, for handling a pump at the bottom of a shaft 240 feet below the level of the ground.

Its design presented unusual problems because of limited head-room and exacting requirements as to hook approaches, etc.

The Euclid organization has been solving problems of this kind for a third of a century. This experience is at your disposal. Tell us your problem and we will work with you.

**THE EUCLID CRANE & HOIST CO.**  
1361 CHARDON RD. . . . EUCLID, OHIO

**EUCLID  
CRANES  
&  
HOISTS**



## Senate Group Urged to Limit Scrap Exports to 25 Per Cent

WASHINGTON.—Limiting scrap exports by presidential licensing power to 25 per cent of domestic consumption was urged before a subcommittee of the Senate Military Affairs Committee on Tuesday by Dr. Bradley Stoughton, engineering school dean of Lehigh Univer-

sity, who appeared as technical witness for the Independent Iron and Steel Producers Committee on Scrap.

Dr. Stoughton recommended that out of all scrap exported under such licensing restrictions not more than 20 per cent be No. 1 heavy melting or railroad scrap with the 80 per cent

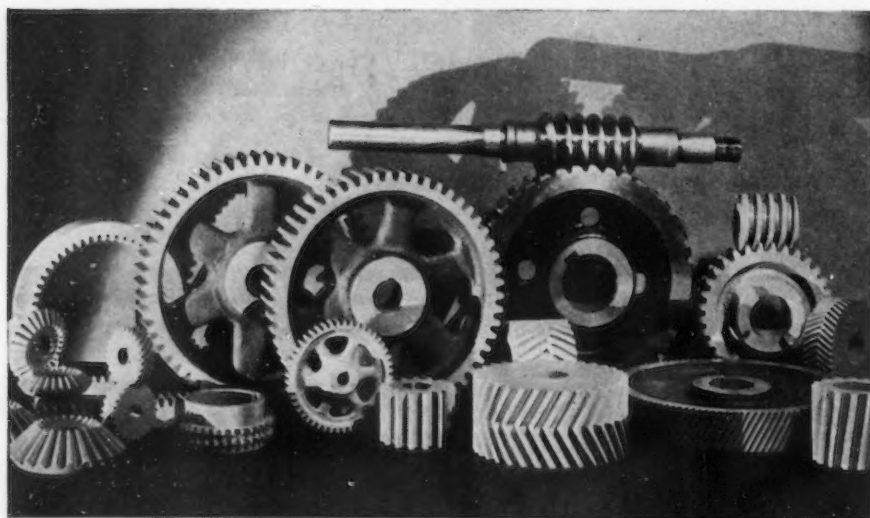
balance to be made up of No. 2 heavy melting and lower grades to meet foreign requirements.

Describing such limitations as a reasonable proposal and discounting the theory that our present scrap supply is inexhaustible the witness said that such legislation would "protect the steel industry, particularly the small companies, yet it leaves the way open for scrap dealers to secure permission to export scrap at a time when the steel industry is operating at a low rate and not buying scrap."

Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, took vigorous exception to Dr. Stoughton's statement that the independent steel producers were advocating the legislative curb in the interest of conservation and national defense. Schwartz charged that the objective of proponents was to obtain a price control over scrap.

He expressed himself as "unalterably opposed" to any limitation on scrap exports, pointing out that such legislation would be "unwarranted discrimination" against one commodity and would be contrary to the best interest of national defense. He estimated that had the 7,000,000 tons of scrap exported been prohibited it would have stayed on the domestic market as "distress" scrap, causing a complete collapse of scrap prices when scrap is one of the few commodities which operates in a "free and open market."

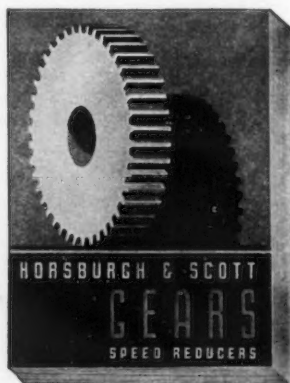
Senator Josh Lee, Democrat, of Oklahoma, and Senator Thomas, subcommittee chairman, were the only committee members present. At least a dozen scrap men were with Schwartz delegation. Experts from five Government departments were asked to remain during an afternoon session by Senator Thomas who described the subject as one of the biggest questions facing the committee. There was no indication, however, in his remarks that the committee would give its approval to the proposed legislation.



## GEARS! GEARS! GEARS! FROM AN OUNCE TO 20,000 POUNDS

● Whether you require Spur, Spiral, Helical, Herringbone, Bevel, Mitre, Internal or Worm Gears or Worms or Non-metallic Pinions . . . here they are . . . the finest made. For nearly half a century Horsburgh & Scott has concentrated on making gears that represent the best in engineering design, accurate workmanship and fine materials. Best of all, they're not expensive because they're standardized and made to endure. On your next order try these finest of gears.

Send for this valuable  
448 page Reference Book.



## THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A

### Pittsburgh Orders Lag Behind Inquiries

PITTSBURGH—Machine tool inquiries during the past week are in slightly better volume, however, the lag between requests for data and firm contracts has become extended. A fair portion of the inquiries are for estimating purposes. Orders are in no better volume than a week ago, and it is now apparent that March business will be less than that placed in February. Despite the domestic situation, however, machine tool plants are relatively busy on export orders.



# March Iron Output Gains 1 Per Cent

**P**RODUCTION of coke pig iron in March totaled 1,452,487 gross tons, compared with 1,298,268 tons in February. The daily rate last month showed a gain of 1 per cent over that of February, or from 46,367 tons to 46,854 tons. Production for the first quarter this year amounted to 4,159,840 tons, against 9,670,191 tons in the corresponding period last year.

On April 1 there were 90 furnaces making iron, operating at the rate of 46,480 tons daily, compared with 91 furnaces in blast on March 1, producing at the rate of 47,045 tons daily. Three furnaces were blown out or banked during the month and two were put in operation. Independent steel producers blew in two and took the same number off blast, and merchant producers banked one furnace.

Among the furnaces blown out or banked were the following: One River, Republic Steel Corp.; the Portsmouth furnace of Wheeling Steel Corp., and a Woodward Iron Co. unit.

Furnaces blown in included an Aliquippa furnace of the Jones & Laughlin Steel Corp., and the Riverside unit of Wheeling Steel Corp.

## Daily Average Production of Coke Pig Iron

	Gross Tons				
	1938	1937	1936	1935	1934
January .....	46,100	103,597	65,351	47,656	39,201
February .....	46,367	107,115	62,886	57,448	45,131
March .....	46,854	111,596	65,816	57,098	52,243
April .....	.....	113,055	80,125	55,449	57,561
May .....	.....	114,104	85,432	55,713	65,900
June .....	.....	103,584	86,208	51,570	64,338
½ year .....	.....	108,876	74,331	54,138	54,134
July .....	.....	112,866	83,686	49,041	39,510
August .....	.....	116,317	87,475	56,316	34,012
September .....	.....	113,679	91,010	59,216	29,935
October .....	.....	93,311	96,512	63,820	30,679
November .....	.....	66,891	98,246	63,864	31,898
December .....	.....	48,075	100,485	67,950	33,149
Year .....	.....	100,305	83,658	67,556	43,592

## Production of Coke Pig Iron and Ferromanganese

	Gross Tons		Gross Tons	
	Pig Iron*		Ferromanganese†	
	1938	1937	1938	1937
January .....	1,429,085	3,211,500	22,388	23,060
February .....	1,298,268	2,999,218	20,205	24,228
March .....	1,452,487	3,459,473	21,194	27,757
April .....	.....	3,391,665	.....	26,765
May .....	.....	3,537,231	.....	34,632
June .....	.....	3,107,506	.....	34,415
½ year .....	.....	19,706,593	.....	170,857
July .....	.....	3,498,858	.....	23,913
August .....	.....	3,605,818	.....	29,596
September .....	.....	3,410,371	.....	26,100
October .....	.....	2,892,629	.....	26,348
November .....	.....	2,006,724	.....	25,473
December .....	.....	1,490,324	.....	22,674
Year .....	.....	36,611,317	.....	324,961

\*These totals do not include charcoal pig iron.  
†Included in pig iron figures.

## Merchant Iron Made, Daily Rate

	Tons				
	1938	1937	1936	1935	1934
January .....	10,635	16,106	10,537	3,926	7,800
February .....	8,854	16,514	11,296	6,288	7,071
March .....	8,524	16,457	10,831	7,089	7,197
April .....	.....	14,517	13,897	8,799	8,838
May .....	.....	19,483	12,814	8,441	9,099
June .....	.....	15,870	14,209	7,874	9,499
July .....	.....	19,609	11,619	8,644	7,880
August .....	.....	17,831	12,148	8,194	6,043
September .....	.....	20,065	12,526	10,090	4,986
October .....	.....	18,950	13,645	11,199	5,765
November .....	.....	15,662	14,739	12,503	6,610
December .....	.....	10,964	14,852	13,312	4,399

## Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		April 1		March 1	
	March (31 Days)	February (28 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
<b>New York:</b>						
Buffalo .....	97,348	91,253	6	3,140	6	3,095
Other New York and Mass. ....	.....	.....	0	.....	0	.....
<b>Pennsylvania:</b>						
Lehigh Valley .....	36,713	47,302	4	1,185	4	1,525
Schuylkill Valley .....	16,305	17,257	1	525	1	525
Susquehanna and Lebanon Valleys .....	15,933	12,262	1	515	1	440
Ferromanganese .....	.....	.....	0	.....	0	.....
Pittsburgh District .....	261,123	231,011	16	8,495	15	8,250
Ferro. and Spiegel .....	9,616	10,585	2	310	2	380
Shenango Valley .....	22,167	14,434	1	715	1	515
Western Pennsylvania .....	27,449	27,698	2	885	2	990
Ferro. and Spiegel .....	6,375	4,705	1	205	1	170
Maryland .....	97,692	98,601	4	3,150	4	3,520
Wheeling District .....	105,525	87,657	6	3,565	5	3,130
<b>Ohio:</b>						
Mahoning Valley .....	126,857	108,205	7	4,090	7	4,050
Central and Northern .....	87,316	81,907	5	2,660	6	2,925
Southern .....	34,529	31,267	3	790	4	1,395
Illinois and Indiana .....	271,589	225,819	13	8,760	13	8,460
Michigan and Minnesota .....	41,394	37,166	3	1,335	3	1,325
Colorado, Missouri and Utah .....	17,365	21,025	2	560	2	750
<b>The South:</b>						
Virginia .....	.....	.....	0	.....	0	.....
Kentucky .....	12,869	11,870	1	415	1	425
Alabama .....	159,119	133,329	11	5,010	12	5,000
Ferro. and Spiegel .....	5,203	4,915	1	170	1	175
Tennessee .....	.....	.....	0	.....	0	.....
<b>Total .....</b>	<b>1,452,487</b>	<b>1,298,268</b>	<b>90</b>	<b>46,480</b>	<b>91</b>	<b>47,045</b>

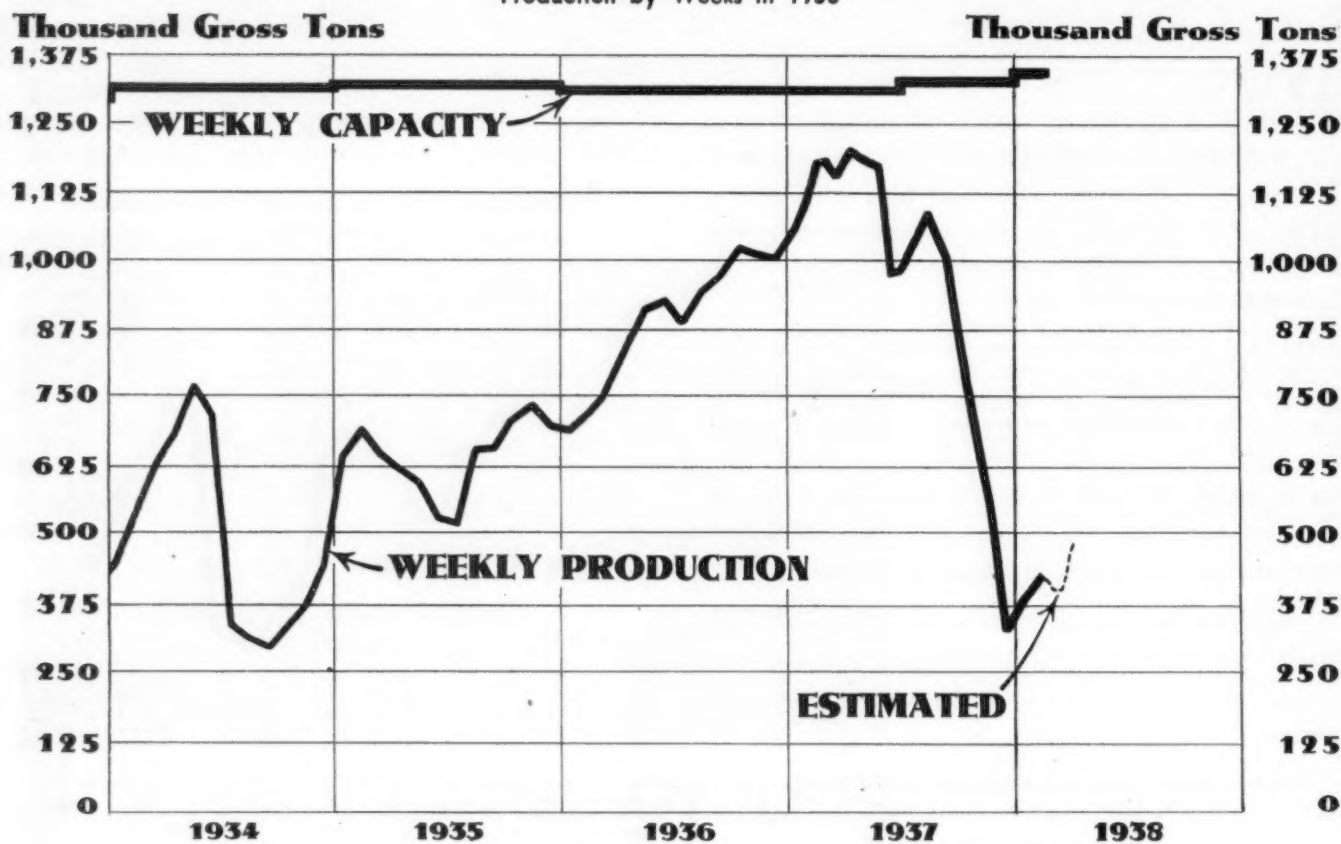
## Detroit Job Index Drops Five Points

**I**NDUSTRIAL employment index of the Detroit Board of Commerce showed another decided drop April 1, standing at 70.5 compared with 75.3 on March 15 and 87.3 a year ago, during the Chrysler strike. The decline is attributed partly to the return of many Detroit plants to the plan of operating a regular force rather than staggering employment with two or three groups. An additional factor is the layoff of more than 20,000 Ford employees in the last week of March which brings employment in the Rouge plant to less than 23,000.

**General Alloys Co.**, 367-405 West First Street, Boston, engineers and manufacturers of severe service alloys, has appointed Ladd Equipment Co., First National Bank Bldg., Pittsburgh, as representative for western Pennsylvania, West Virginia, Garrett and Allegany counties in Maryland and counties in Ohio along that state's eastern border.

# PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1934-1937, and Estimated Production by Weeks in 1938



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

## STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

	Current Week	Last Week
Pittsburgh .....	29.0	33.0
Chicago .....	31.0	32.5
Valleys .....	31.0	32.0
Philadelphia .....	29.0	29.0
Cleveland .....	25.0	29.0
Wheeling .....	61.0	66.0
Buffalo .....	28.5	29.5
Detroit .....	19.5	19.5
Southern .....	49.0	49.0
S. Ohio River .....	19.5	27.0
Western .....	30.0	30.0
St. Louis .....	44.5	49.5
Eastern .....	50.0	50.0
Aggregate .....	32.5	35.5

## Weekly Booking of Construction Steel

	Apr. 5, 1938	Week Ended Mar. 29, 1938	Mar. 8, 1938	Apr. 6, 1937	Year to Date 1938	1937
Fabricated structural steel awards.....	16,650	12,400	11,450	36,650	169,275	361,245
Fabricated plate awards.....	1,995	3,000	14,270	2,755	46,545	50,760
Steel sheet piling awards.....	890	0	145	0	6,770	14,925
Reinforcing bar awards.....	1,235	1,180	2,675	7,265	53,670	48,020
Total Lettings of Construction Steel.....	20,770	16,580	28,540	46,670	276,260	474,950

## ...SUMMARY OF THE WEEK...

... *Ingot production drops three points to 32½ per cent.*

° ° °

... *April output not expected to rise much, if any, above March.*

° ° °

... *Steel scrap lower; composite drops under 1937 minimum.*

REFLECTING the irregular flow of business under present uncertain conditions, steel ingot production has declined three points from last week to 32½ per cent of the country's capacity. The moderate improvement in orders during a part of March has not been accelerated, but on the contrary has in some respects flattened out.

Whether the slight spurt in orders last month could be attributed in part at least to a desire among steel users to anticipate the effective dates of freight rate advances is not certain, since the savings in most instances would not amount to more than 40c. a ton and many are not more than 20c. a ton. The finished steel rate from Pittsburgh to New York, for example, rises only from 34c. to 36c. per 100 lb., or 40c. a net ton. On finished steel the new rates are effective April 6, while on semi-finished steel and pig iron they do not apply until April 11.

To some extent last week's rise in steel ingot production was due to replenishment of mill stocks of ingots and semi-finished steel. But as orders have not continued their slight upward trend, production rates have dropped in all important districts.

The Pittsburgh district is off four points to 29 per cent; Chicago is down one and a half points to 31 per cent; the Youngstown area is one point lower at 31 per cent; the Cleveland-Lorain district has dropped four points to 25 per cent; the Wheeling-Weirton district has declined from 66 to 61 per cent, and the Southern Ohio district is down from 27 per cent to 19½ per cent.

It seems unlikely that April production will rise much, if any, above the March rate. Without support from the automobile industry and the railroads and with only moderate aid from building construction, the steel industry is largely dependent on the miscellaneous industries, of which the farm implement and tractor manufac-

turers are giving the best support relatively. Agricultural business generally has been one of the brighter spots, but is still considerably below normal for this time of year.

WHILE automobile sales have been making moderate gains, the volume of business is not large enough to promise an important spurt in production of 1938 models. It is becoming increasingly apparent that most of the automobile manufacturers will require only fill-in lots of steel at least until 1939 models are in production later in the year.

The steel industry is hopeful that some way will be found at Washington to bring the railroads back into the market, as it is obvious that purchases of steel and equipment by the carriers will not improve much until a solution of the railroad problem has been worked out.

Structural steel lettings and inquiries show a minimum of private undertakings. Of 16,650 tons awarded during the week, 5000 tons was for a bridge in Pittsburgh, 1600 tons for a building at the New York World's Fair and 1900 tons for a manufacturing plant at Springfield, Mass., for the Westinghouse Electric & Mfg. Co. Inquiries totaling 23,600 tons include 10,000 tons for a bridge in Cleveland, 1700 tons for a New York World's Fair building, 1500 tons for a hospital in Boston, 1500 tons for an industrial school at Harrisburg, Pa., 1200 tons for a school in Queens, N. Y., and 1120 tons for a bridge at Portland, Ore. Of 8200 tons of reinforcing bars for which inquiries have been issued, 4200 tons is for the United States engineer at Los Angeles.

STEEL scrap prices, having declined again, continue to reflect the uncertain steel outlook. The export movement, which has been a prop to scrap prices in eastern areas as far west as Pittsburgh, has dropped sharply and exporters have lowered their offers as much as \$2 at New York and \$1 at Philadelphia. Domestic prices on steel-making grades have declined 50c. a ton at Pittsburgh, Philadelphia, Cleveland, Buffalo, Detroit and Cincinnati. THE IRON AGE composite has dropped to \$12.83, or 9c. a ton below the lowest level of 1937. Further declines appear to be inevitable as mills are buying very little and dealers find prices still too high for speculative purchases.

Pig iron production in March totaled 1,452,487 tons compared with 1,298,268 tons in February. On a daily basis the March rate was 46,854 tons against 46,367 tons in February, a gain of 1 per cent. Production in the first quarter was 4,159,840 tons compared with 9,670,191 tons in the corresponding period last year. On April 1 there were 90 furnaces making iron, a net loss of one since March 1.



# ...PITTSBURGH...

*... Output of ingots drops sharply.*

• • •

*... March business gained slightly over February.*

• • •

*... Major buyers show little inclination to expand purchases.*

**P**ITTSBURGH, April 5.—An uneven trend in new business, coupled with exceptionally irregular releases on steel shipments, both due to hand-to-mouth buying policies, make scheduling of steel ingot output a difficult matter for producers. Hence a drop in raw steel output of four points to 29 per cent of capacity in the Pittsburgh district this week is not considered significant except that it portrays current uncertainties. The Wheeling-Weirton district is down five points this week to 61 per cent of capacity.

For the Pittsburgh district as a whole, March bookings were roughly about 10 to 15 per cent ahead of those of February. With three more working days in March, tonnages on a daily basis reflected little or no difference. Some companies, however, registered moderate gains in March while certain products such as semi-finished steel, wire and wire products, bars and, to some extent, structural steel, were slightly more active than in February.

Meanwhile, incoming business during the past week continued to move sideways with no definite trend discernible. Producers, however, expect that total April business will run ahead of that of March. Major support for the steel market is still emanating from miscellaneous sources as major buyers have shown little or no inclination to expand purchases.

Bethlehem Steel Co. will fabricate 5000 tons of material for a Highland Park bridge at Pittsburgh and 1900 tons for a Westinghouse Electric & Mfg. Co. building at Springfield, Mass.

Raw material markets are dull with

No. 1 heavy melting steel off 50c. on appraisal to a range of \$12.75 to \$13.25.

## **Pig Iron**

Compared with February, pig iron shipments, production and orders expanded slightly in March but the increases on a daily basis were not large. Moderately encouraging was a better diversification in orders. New business in the past week still reflects spotty and hand-to-mouth buying policies.

## **Semi-Finished Steel**

Business during the past week was a shade below that booked during the previous week. Semi-finished steel for non-integrated tin plate makers continues to represent major current activity. Otherwise demand remains dull and intermittent.

## **Bars, Plates and Shapes**

Owing to partial depletion of consumers' stocks and expansion in fill-in requirements, hot rolled bar sales in March improved moderately from February volume. With major steel buyers still virtually absent from the market, current business is supported largely by miscellaneous demand. Total specifications in the past week are about equal to the previous period. Bethlehem Steel Co. will supply 1900 tons of material for a Westinghouse Electric & Mfg. Co. building at Springfield, Mass., and was also awarded the contract for a Highland Park bridge, Pittsburgh, involving 5000 tons. The volume of both structural inquiries and awards is substantially the same as a week ago with

public financed projects predominating.

## **Reinforcing Bars**

Although a considerable amount of work is still pending, both inquiries and awards during the past week were few in number. Specifications to the mills are running in about the same volume as during the past few weeks.

## **Cold Finished Bars**

Total business during March was ahead of that booked in February, which was exceptionally dull from a tonnage standpoint. With the automotive industry buying little or no steel, the main support for cold finished bars is coming from jobbers' fill-in orders. Some purchases by farm implement manufacturers have been made recently.

## **Sheets and Strip**

Aggregate sheet business in March reflected an improvement over February tonnages. Bookings during the latter month, however, were at a low point. The small amount of business which is coming from automobile makers represents fill-in requirements only. Major support to current bookings is miscellaneous demand which continues on a hand-to-mouth basis. Hot rolled strip bookings are no better than a week ago.

## **Wire**

Orders for merchant wire products are holding to the level of a week ago, while miscellaneous manufacturers' wire demand has shown a moderate improvement. Some makers anticipate a better movement in nails as spring construction projects get under way. Wire and wire product orders during March were about 30 to 40 per cent ahead of those placed in February. Agricultural areas continue to be the best source of business.

## **Tubular Goods**

Total tubular goods sales are off slightly from a week ago. Oil-country goods specifications have receded some in the past week but this trend is prob-

# A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous  
Advances Over Past Week in Heavy Type, Declines in Italics

## Rails and Semi-finished Steel

Per Gross Ton:	Apr. 5, 1938	Mar. 29, 1938	Mar. 8, 1938	Apr. 6, 1937
Rails, heavy, at mill.....	\$42.50	\$42.50	\$42.50	\$42.50
Light rails, Pittsburgh.....	43.00	43.00	43.00	43.00
Rerolling billets, Pittsburgh.	37.00	37.00	37.00	37.00
Sheet bars, Pittsburgh.....	37.00	37.00	37.00	37.00
Slabs, Pittsburgh.....	37.00	37.00	37.00	37.00
Forging billets, Pittsburgh..	43.00	43.00	43.00	43.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	47.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	2.10	2.10	2.10	2.10

## Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	2.45	2.45	2.45	2.45
Bars, Chicago.....	2.50	2.50	2.50	2.50
Bars, Cleveland.....	2.50	2.50	2.50	2.50
Bars, New York.....	2.81	2.79	2.79	2.78
Plates, Pittsburgh.....	2.25	2.25	2.25	2.25
Plates, Chicago.....	2.30	2.30	2.30	2.30
Plates, New York.....	2.55	2.54	2.54	2.53
Structural shapes, Pittsburgh	2.25	2.25	2.25	2.25
Structural shapes, Chicago..	2.30	2.30	2.30	2.30
Structural shapes, New York	2.52	2.5125	2.5125	2.5025
Cold-finished bars, Pittsburgh	2.90	2.90	2.90	2.90
Hot-rolled strips, Pittsburgh	2.40	2.40	2.40	2.40
Cold-rolled strips, Pittsburgh	3.20	3.20	3.20	3.20
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	3.15	3.15	3.15	3.15
Hot-rolled annealed sheets, No. 24, Gary.....	3.25	3.25	3.25	3.25
Sheets, galv., No. 24, P'gh..	3.80	3.80	3.80	3.80
Sheets, galv., No. 24, Gary..	3.90	3.90	3.90	3.90
Hot-rolled sheets, No. 10, Pittsburgh.....	2.40	2.40	2.40	2.40
Hot-rolled sheets, No. 10, Gary.....	2.50	2.50	2.50	2.50
Cold-rolled sheets, No. 20, Pittsburgh.....	3.45	3.45	3.45	3.55
Cold-rolled sheets, No. 20, Gary.....	3.55	3.55	3.55	3.65
Wire nails, Pittsburgh.....	2.75	2.75	2.75	2.75
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.80
Plain wire, Pittsburgh.....	2.90	2.90	2.90	2.90
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.95
Barbed wire, galv., P'gh....	3.40	3.40	3.40	3.40
Barbed wire, galv., Chicago dist. mill.....	3.45	3.45	3.45	3.45
Tin plate, 100-lb. box, P'gh.	\$5.35	\$5.35	\$5.35	\$5.35

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

## Pig Iron

Per Gross Ton:	Apr. 5, 1938	Mar. 29, 1938	Mar. 8, 1938	Apr. 6, 1937
No. 2 fdy., Philadelphia.....	\$25.84	\$25.84	\$25.84	\$25.76
No. 2, Valley furnace.....	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti.....	23.89	23.89	23.89	23.69
No. 2, Birmingham.....	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago*....	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.....	25.34	25.34	25.34	25.26
Basic, Valley furnace.....	23.50	23.50	23.50	23.50
Malleable, Chicago*.....	24.00	24.00	24.00	24.00
Malleable, Valley.....	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago.....	30.24	30.24	30.24	30.04
Ferromanganese, seab'd, car- lots.....	102.50	102.50	102.50	95.00

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.

\*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

## Scrap

Per Gross Ton:				
Heavy melting steel, P'gh...	\$13.00	\$13.50	\$13.75	\$23.25
Heavy melting steel, Phila...	13.75	14.25	14.25	20.75
Heavy melting steel, Ch'go..	11.75	11.75	12.25	21.75
Carwheels, Chicago.....	13.50	13.50	14.00	21.25
Carwheels, Philadelphia....	15.75	15.75	15.25	21.75
No. 1 cast, Pittsburgh.....	14.75	15.25	15.75	20.25
No. 1 cast, Philadelphia.....	15.75	15.75	15.75	22.75
No. 1 cast, Ch'go (net ton)..	11.25	11.25	11.75	17.00
No. 1 RR. wrot., Phila.....	15.25	15.25	15.25	20.50
No. 1 RR. wrot., Ch'go (net)	9.25	9.25	9.75	19.00

## Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt.....	\$4.00	\$4.00	\$4.00	\$4.25
Foundry coke, prompt.....	5.00	5.00	5.00	4.75

## Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn...	10.00	10.00	10.00	16.00
Lake copper, New York....	10.125	10.125	10.125	16.12½
Tin (Straits), New York....	38.10	40.50	41.75	61.87½
Zinc, East St. Louis.....	4.15	4.25	4.75	7.50
Zinc, New York.....	4.54	4.64	5.10	7.85
Lead, St. Louis.....	4.35	4.35	4.35	6.75
Lead, New York.....	4.50	4.50	4.50	6.90
Antimony (Asiatic), N. Y...	15.75	15.75	15.75	17.00

# The Iron Age Composite Prices

## Finished Steel

April 5, 1938  
One week ago  
One month ago  
One year ago

2.605c. a Lb.  
2.605c.  
2.605c.  
2.605c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

	HIGH	LOW
1938.....	2.605c., Mar. 9;	2.330c., Mar. 2
1937.....	2.330c., Dec. 28;	2.084c., Mar. 10
1936.....	2.130c., Oct. 1;	2.124c., Jan. 8
1935.....	2.199c., Apr. 24;	2.008c., Jan. 2
1934.....	2.015c., Oct. 3;	1.867c., Apr. 18
1933.....	1.977c., Oct. 4;	1.926c., Feb. 2
1932.....	2.037c., Jan. 13;	1.945c., Feb. 29
1931.....	2.273c., Jan. 7;	2.018c., Dec. 9
1930.....	2.317c., Apr. 2;	2.273c., Oct. 29
1929.....	2.286c., Dec. 11;	2.217c., July 17
1928.....	2.402c., Jan. 4;	2.212c., Nov. 1
1927.....		

## Pig Iron

\$23.25 a Gross Ton  
23.25  
23.25  
23.25

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

	HIGH	LOW
\$23.25, Mar. 9;	\$20.25, Feb. 16	
19.73, Nov. 24;	18.73, Aug. 11	
18.84, Nov. 5;	17.83, May 14	
17.90, May 1;	16.90, Jan. 27	
16.90, Dec. 5;	13.56, Jan. 3	
14.81, Jan. 5;	13.56, Dec. 6	
15.90, Jan. 6;	14.79, Dec. 15	
18.21, Jan. 7;	15.90, Dec. 16	
18.71, May 14;	18.21, Dec. 17	
18.59, Nov. 27;	17.04, July 24	
19.71, Jan. 4;	17.54, Nov. 1	

## Steel Scrap

\$12.83 a Gross Ton  
13.17  
13.42  
21.92

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
\$14.00, Jan. 4;	\$12.83, Apr. 5	
21.92, Mar. 30;	12.92, Nov. 16	
17.75, Dec. 21;	12.67, June 9	
13.42, Dec. 10;	10.33, Apr. 23	
13.00, Mar. 13;	9.50, Sept. 25	
12.25, Aug. 8;	6.75, Jan. 3	
8.50, Jan. 12;	6.43, July 5	
11.33, Jan. 6;	8.50, Dec. 29	
15.00, Feb. 18;	11.25, Dec. 9	
17.58, Jan. 29;	14.08, Dec. 3	
16.50, Dec. 31;	13.08, July 2	
15.25, Jan. 17;	13.08, Nov. 22	

ably not significant, inasmuch as weekly tonnages during the past few months have been rather irregular.

### **Tin Plate**

Tin plate demand continues to be somewhat below expectations. Packers' specifications have been fairly good recently but bookings from general line can makers continue to reflect ample stocks at the latter's plants. Tin plate production is unchanged this week at 55 per cent.

## **..CAST IRON PIPE..**

Shrewsbury, Mass., has awarded 250 tons of 6-in. pipe to Warren Foundry & Pipe Corp., Boston.

Marlboro, Mass., closed bids April 4 on 9000 ft. of 6-in. pipe.

Canton, Mass., has awarded 100 tons of 12-in. to Warren Foundry & Pipe Corp., Boston.

Natick, Mass., has taken under advisement bids for 10,000 ft. of 6, 8 and 10-in. pipe, class 150.

Andover, Mass., has awarded its 1938 contract for pipe to Warren Foundry & Pipe Corp., Boston.

Lancaster, Mass., has taken under advisement bids for 8000 ft. of 10-in. pipe.

Gloucester, Mass., has awarded a contract for its 1938 6 to 12-in. pipe requirements to Warren Foundry & Pipe Corp., Boston, but has yet to place 200 tons of 20-in. pipe.

Dillon, S. C., plans pipe line extensions and other waterworks installation. Fund of \$50,000 has been secured through Federal aid for this and highway improvements.

Beulah Water District, Beulah, Colo., recently organized, Warren L. Parker, director, plans pipe lines for water system and other waterworks installation. Cost about \$35,000. Bond issue will be arranged soon.

Asotin, Wash., plans about 4000 lin. ft. of 6-in. for extensions and replacements in water system.

Toledo, Ohio, plans pipe line extensions and improvements in water system; also expansion in municipal filtration plant and pumping station on Broadway, with installation of additional equipment. Entire project is estimated to cost \$2,450,000. Financing will be arranged. J. N. Eddy is city manager in charge.

Keokuk, Iowa, closes bids April 22 for pipe for water system; also for elevated steel tank and tower and other waterworks installation. Cost about \$300,000. Financing has been arranged through Federal aid. Brown Engineering Co., Ottumwa, Iowa, is consulting engineer.

Kouts, Ind., plans pipe line extensions and replacements in water system. Cost about \$45,000. Financing has been arranged through Federal aid. Suhr, Berryman, Peterson & Suhr, 130 North Wells Street, Chicago, are consulting engineers.

Necedah, Wis., closed bids April 6 on 8000 ft. of 6-in., and 4000 ft. of 8-in., and will ask bids later on additional 9000 lin. ft. of 6-in. water pipe.

Friendship, Wis., has placed about 150 tons of 4 to 8-in. water pipe with James B. Clow & Sons, Chicago.

Butternut, Wis., has low bid from United State Pipe & Foundry Co. on about 175 tons of 4 to 8-in. water pipe.

Board of District Commissioners, Washington, has low bid from Columbia Foundation Co., 2209 Channing Street, N.E., for 7490 ft. of 36-in. pipe for main water line, at \$92,211.

Parkersburg, W. Va., plans pipe line extensions in water system. Fund of about \$40,000 has been arranged.

Waterloo, Iowa, plans about 1040 ft. of 6-in. and 850 ft. of 8-in. for extensions in water system.

Rossville, Ind., closes bids April 12 for pipe for water system, including 9145 ft. of 4-in., 4758 ft. of 6-in., and 330 ft. of 8-in.; also for 60,000-gal. elevated steel tank and tower, with alternate bids on similar tanks of 75,000, 50,000 and 40,000-gal. capacity; one 200-gal. per min. turbine pumping unit and auxiliary equipment. Cost about \$60,000. Charles Hurd, Architects and Builders Building, Indianapolis, is consulting engineer.

Oketo, Kan., plans pipe lines for water system and other waterworks installation, including 25,000-gal. elevated steel tank and tower. Bond issue is being arranged. Paulette & Wilson, 106 Kansas Avenue, Topeka, Kan., and Farmers Union Building, Salina, Kan., are consulting engineers.

Los Angeles Department of Water and Power has awarded 194 tons of 4 and 16-in. pipe to American Cast Iron Pipe Co., Los Angeles.

United States Treasury Procurement Office, San Francisco, is inquiring for 200 tons of 8-in. pipe for delivery at Oakland, Calif.

## **....PIPE LINES....**

Continental Oil Co., Ponca City, Okla., plans welded steel pipe line for natural gas transmission for new casinghead gasoline plant to be built in K-M-A oil field area, Wichita County, Tex. New line will have a capacity of about 15,000,000 cu. ft. of gas per day, with booster station and operating facilities.

Finance Oil & Gas Co., Gowanda, N. Y., plans steel pipe lines in connection with development of sand gas properties in Medina field, near Wesley, N. Y., for natural gas transmission; also installation of steel casing for drilling operations.

Byrd-Frost, Inc., Petroleum Tower Building, Dallas, Tex., D. H. Byrd, head, plans welded steel pipe line to new natural gasoline plant to be erected in gas field area at Tucker, Tex. Line will have a capacity for handling about 20,000,000 cu. ft. per day from company wells, with booster station and operating facilities.

Winthrop, Minn., plans steel pipe lines for extensions and replacements in municipal steam distributing system for central heating. Surveys and estimates of cost are being made. Rose & Harris, Essex Building, Minneapolis, Minn., are consulting engineers.

Washtenaw Gas Co., Ann Arbor, Mich., plans welded steel pipe line for connection with main gas transmission line from Michigan gas field, or to point near Detroit, for tapping line from Texas gas field districts, for natural gas supply for local distribution. Company is arranging new local franchise and will determine source of gas supply in near future.

Oklahoma Pipe Line Co., Tulsa, Okla., has approved plans for new 8-in. welded steel pipe line from present system at Springer, Okla., to Sulphur, about 21 miles, for crude oil transmission. Cost over \$150,000 with booster stations and operating facilities.

Corpus Christi, Tex., plans extensions in pipe lines for municipal gas distribution. Fund of \$21,375 has been secured through Federal aid.

King County Water District No. 50, Sunnyhill, Wash., will install about 42,000 lin. ft. of 2 to 6-in. steel pipe for water system; also new 40,000-gal. elevated steel tank and tower. Installation will be made by WPA labor. Entire project will cost about \$44,300.

## **...BOSTON...**

**...Pig iron dull; jobbers advance prices on some products.**

BOSTON, April 5. — Another month starts with no improvement in the movement of pig iron. Sales the past week were not over 500 tons. The rate of New England foundry melt has dropped back to not more than 15 per cent, and the outlook for increase is not bright. However, the steel and allied industrial situation is a shade better due largely to the resumption of partial operations at the American Steel & Wire Co. plant at Worcester, and Washburn Wire Co. plant at Phillipsdale, R. I.

Sales of 50 to 75-ton lots of cast iron pipe have been quite numerous. The Warren Foundry & Pipe Corp., Everett, Mass., for some time operating three days a week, is to step up operations one day a week.

Warehouses have revised upward prices on heavy hot rolled products, sheets and cold rolled steel bars. Until new freight rates for points outside Boston are available warehouses will add 10 per cent to old freight rates.

## **..BIRMINGHAM..**

**...Moderate flow of new tonnage; operations unchanged.**

BIRMINGHAM, April 5.—There is a regular, moderate flow of new steel tonnage, which has brightened the steel outlook and maintained operations at a steady rate. For some weeks the market has been better and the demand has spread to bars, plates and shapes, in addition to sheets and wire products.

Prospective railroad business, anticipated after the freight rate increase, is not materializing. Present rail bookings will permit the operation of the Ensley railmill to the middle of May.

The Fairfield tinplate mill is gradually increasing operations, building up stocks and adjusting equipment.

Twelve open hearths were worked last week, six at Fairfield, three at Ensley and three at Gadsden. The same number is scheduled this week. The blast furnace total is still 12.



# ... CHICAGO ...

... *Ingot output declines one and a half points.*

o o o

... *April sales not expected to equal March's.*

o o o

... *Railroad relief program watched with interest.*

CHICAGO, April 5.—As the result of the action of one producer, ingot output this week has fallen one and one-half points to 31 per cent of capacity. Production of pig iron is unchanged, with 13 furnaces continuing in blast.

Conforming to tradition, last month was the best thus far in the year. Orders slackened the last week of March, however, with the exception of pig iron and merchant wire products, and they have not yet resumed the volume of a month ago. Only one seller expects April to equal March, and the others feel that little encouragement is in sight until July or August when there is a possibility of new automobile models being introduced.

Certain it is that no one anticipates much steel buying for motor cars, railroads or construction in the near future. Without more hearty cooperation from labor and the Government, the carriers' buying power may not attain its normal level. There is no doubt of their need for equipment of all kinds, but their present financial condition as a whole makes the necessary large expenditures out of the question. Steel sellers are hopeful that some good will result from the conferences now being asked by the President for the purpose of affording relief to the roads and restoring some of their purchasing ability.

The one consistent buyer during these past months of low steel operations has been the farm implement and tractor trade. Although trimmed down somewhat, along with the curtailment in all lines, its purchases still are providing the backbone of many an office's order book.

Buying from the rural districts has greatly aided the sales of wire products but this business is still 40 per cent under normal, according to sellers here.

Heavy melting steel scrap is quoted at \$11.50 to \$12, unchanged from last week.

## Wire and Wire Products

Although orders for merchant wire products continue to be received at a rate 50 per cent higher than a few weeks ago, the order book for the entire line in this district is still probably 40 per cent below normal, according to leading sellers here. A curtailment of ordinary rural buying and a lack of interest in the manufacturing wire items are chief factors in the poor showing. Relatively, however, the wire line is the best performer at the moment among the various steel products and the demand from the farm regions is expected to last into June.

## Structural Shapes and Reinforcing Bars

Construction activity in this district is far below normal, in spite of this

being the time of year when building interest usually increases. The great majority of such projects as are being considered at present are backed by public funds.

## Warehouse Business

Jobber business in March exceeded that done in either of the first two months of the year, but only by 8 to 10 per cent, which is less than was expected.

## Pig Iron

March shipments of iron increased varying from 25 to nearly 60 per cent, but most of this tonnage was for immediate use and came about almost entirely as a result of depletion of inventories during the month. Foundry coke shipments rose about 15 per cent over those of February. Sellers are of the opinion that this rise in shipping activity will be maintained through April and May, as other foundries gradually clean up the stocks remaining from last fall.

## Shapes and Plates

Demand for flat rolled products is no better. Deliveries of all grades of sheets still range downward from three weeks, while plates are available practically as soon as the mill can turn them out. Automobile demand has not improved, and while a fair interest in sheets is being expressed by miscellaneous users, orders involving large tonnages are not apparent. Railroad buying of plates is at an absolute minimum. Some oil field consumption is reported, a recent order for 3000 tons for tanks going to Chicago Bridge & Iron Works.

## Bars

The level of bar demand is being maintained by jobbers and makers of farm implements. Delivery is practically prompt and no great rise in activity among bar producers is anticipated unless motor car production increases.

## TAPERED STEEL RODS

A SUBSCRIBER desires to purchase steel rods from 54 to 60 in. in length, tapering from about 5/16 in. at the one end to 1/8 in. at the other. The steel must have sufficient resiliency to bend back about 50 per cent, or in other words have enough spring to act as a whip. Interested producers may communicate with

THE IRON AGE.

# FABRICATED STEEL

... Lettings higher at 16,650 tons as against 12,400 tons last week.

... New projects advance to 23,600 tons from 11,625 tons a week ago.

... Plate awards total 1995 tons.

## NORTH ATLANTIC STATES

### AWARDS

Cambridge, Mass., 100 tons, Harvard University squash court, to New England Structural Co., Everett, Mass.

Spaulding, N. H., 570 tons, Spaulding high school, to Lyon Iron Works, Inc., Manchester, N. H.

Springfield, Mass., 1900 tons, manufacturing buildings, Westinghouse Electric & Mfg. Co., to Bethlehem Steel Co., Bethlehem, Pa.

Wellesley, Mass., 150 tons, swimming pool and recreation building, Wellesley College, to New England Structural Co., Everett, Mass.

New York, 580 tons, building, General Realty & Utilities Corp., to Bethlehem Steel Co., Bethlehem, Pa.

New York, 1300 tons, superstructure for State amphitheater, World's Fair, to Lehigh Structural Steel Co., Allentown, Pa.

New York, 290 tons, substructure for State amphitheater, World's Fair, to Ingalls Iron Works Co., Birmingham.

Brooklyn, 205 tons, Lincoln Savings Bank building alterations, to Harris Structural Steel Co., Plainfield, N. J.

Tarrytown, N. Y., 230 tons, dormitory building, Marymount College to Levine Brothers Iron Work, Yonkers, N. Y.

Checktowaga, N. Y., 170 tons, State highway bridge, to American Bridge Co., Pittsburgh.

Romulus, N. Y., 120 tons, Central School building, to F. L. Heughes & Co., Rochester, N. Y.

Pittsburgh, 5000 tons, Highland Park bridge for Allegheny County, to Bethlehem Steel Co., Bethlehem, Pa.

Pittsburgh, 276 tons, Buhl Foundation Planetarium, to Pittsburgh Bridge & Iron Co., Pittsburgh.

Baltimore, 120 tons, storage building, to Maryland Steel Products Co., Baltimore.

## SOUTH AND SOUTHWEST

Bedford, Va., 200 tons, State highway project, to Virginia Bridge Co., Roanoke, Va.

Charleston, S. C., 190 tons, buildings for The Citadel, to Carolina Steel & Iron Co., Greensboro, N. C.

Stuart, Va., 400 tons, Blue Ridge Parkway project, to Virginia Bridge Co., Roanoke, Va.

Lincoln-McCormick Counties, Ga., 810 tons, bridge project, to Nashville Bridge Co., Nashville, Tenn.

Dallas, Tex., 210 tons, Coca Cola building, to J. B. Beard Corp., Shreveport, La.

Houston, Tex., 315 tons, Texas Co. office building, to Mosher Steel Co., Houston, Tex.

Garvin County, Okla., 320 tons, bridge, to J. B. Klein Iron & Foundry Co., Oklahoma City.

## CENTRAL STATES

Dearborn, Mich., 750 tons, coal handling structures, Ford Motor Co., to Whitehead & Kales Co., Detroit.

Adrian, Mich., 180 tons, magnesium foundry for Bohn Aluminum & Brass Corp., to Palmer-Bee Co., Detroit.

Gibson County, Ind., 135 tons, highway bridge, to Vincennes Bridge Co., Vincennes, Ind.

Kenosha, Wis., 105 tons, bridge, to Worden-Allen Co., Milwaukee.

Jewell County, Kan., 115 tons, bridge, to St. Joseph Structural Steel Co., St. Joseph, Mo.

Muscatine, Iowa, 225 tons, bridge, to Rock Island Bridge & Iron Works, Rock Island, Ill.

## WESTERN STATES

Sacramento, Cal., 250 tons, cranes for Western Pacific Railroad, to Whiting Corp., Harvey, Ill.

Sacramento, 500 tons, Western Pacific Railroad Shops, to Columbia Steel Co., San Francisco.

Compton, Cal., 244 tons, Olive Street, Wilmington Boulevard, and Compton Boulevard bridges over Compton Creek for United States Engineer (Proposal 367), to Bethlehem Steel Co., Los Angeles.

Bakersfield, Cal., 100 tons, hospital, to Consolidated Steel Co., Los Angeles.

Cathlamet, Wash., 400 tons, H columns for Puget Island bridge, to Bethlehem Steel Co.

Seattle, Wash., 175 tons, grandstand roof, to Pacific Car & Foundry Co., Seattle.

## NEW STRUCTURAL STEEL PROJECTS

### NORTH ATLANTIC STATES

Boston, 1500 tons, Massachusetts General Hospital unit.

Cambridge, Mass., 250 tons, addition to Webster School.

Hartford, Conn., 350 tons, addition to Y.M.C.A. building.

Wickford Junction, R. I., 650 tons, State railroad bridge.

New York, 330 tons, alterations to building for Altman Co.

New York, 1700 tons, United States Building, at World's Fair.

New York, 390 tons, World's Fair building for Gas Exhibits, Inc.

New York, 3500 tons, Manhattan bridge roadway repairs; Harris Structural Steel Co., Plainfield, N. J., low bidder.

Brooklyn, 450 tons, addition to public school No. 95.

Queens, N. Y., 1200 tons, public school No. 15.

Queens, N. Y., 4500 tons, land section, East River Tunnel; Charles F. Vachris, Inc., Brooklyn, low bidder.

Malone, N. Y., 120 tons, State School for Deaf.

Weehawken, N. J., 750 tons, approaches to Lincoln Tunnel; James Mitchell, Inc., New York, low bidder.

Harrisburg, Pa., 1500 tons, industrial school.

Newark, N. J., 120 tons, auditorium extension, Mutual Life Insurance Co.

Connellsville, Pa., 230 tons, settling basin, Trotter Water Co.

District of Columbia, 300 tons, Lenox Vocational School.

## THE SOUTH

Philippi, W. Va., 170 tons, State bridge over Tygart River.

Houston, Tex., 600 tons, stadium, Rice Institute.

## CENTRAL STATES

Kalamazoo, Mich., 170 tons, building for Treasury Department.

Cleveland, 10,000 tons, superstructure and bridge railing for Main Street bridge; bids until April 29 by Cuyahoga County Commissioners.

State of Wisconsin, 900 tons, 13 bridges; bids April 19.

Winslow, Neb., 650 tons, bridges.

## WESTERN STATES

Portland, Ore., 1120 tons, highway bridge.

Denver, 800 tons, annex State Capitol.

Grand Coulee Dam, Wash., about 10,000 tons, 40 sets of conduit linings and 80 102-in. ringseal gates; low bidders are: Items 1 and 2, Joshua Hendy Iron Works, San Francisco; items 3 and 4, Valley Iron Works, Yakima, Wash.; items 5 and 6, Lynchburg Foundries, East Radford, Va.; item 7, Consolidated Steel Co., Los Angeles.

Los Angeles, 100 tons, structural steel, sag rods, steel doors and field bolts for city purchasing agent; Western Iron & Metal Co., Los Angeles, low bidder.

## FABRICATED PLATES

### AWARDS

Waterbury, Conn., 1405 tons, gas holder, to Stacey Brothers Gas Construction Co., Cincinnati.

Bradford, Pa., 240 tons, tanks for Kendall Refining Co., to Chicago Bridge & Iron Works, Chicago.

Grand Coulee Dam, Wash., 350 tons, gates, to Mississippi Valley Structural Steel Co., St. Louis.

## SHEET PILING

### AWARDS

Checktowaga, N. Y., 250 tons, Pennsylvania Railroad grade crossing, to Bethlehem Steel Co., Lackawanna, N. Y.

Blaisdell, Ariz., 640 tons, Gila project, to Carnegie-Illinois Steel Corp., Denver.

## ... CLEVELAND ...

*... Ingot output lower under fluctuating demand.*

• • •

*... Farm buying one of principal activities.*

• • •

*... Outlook for automotive business discouraging.*

CLEVELAND, April 5.—Ingot output continues to fluctuate as expected under current business conditions. Both districts show slight reductions this week. The rate for Youngstown and nearby cities is off one point to 31 per cent, a good-sized increase at one plant being offset by slightly lower schedules at other mills. The Cleveland-Lorain average is down four points to 25 per cent due to idleness at one plant over the past weekend.

Averaging all products together, the trend of new orders is more horizontal than vertical. Merchant wire products and galvanized sheets, tin plate, and tubular goods are the most active items. Responsible for the gains shown by the first two classes is spring demand from the agricultural areas, which has been fairly satisfactory, although not quite as strong as expected. Sales of merchant wire products this year reached the seasonal peak about 10 days earlier than usual and have been more nearly normal than those of any other steel mill product.

Farm buying is helping to sustain activity in a wide range of manufactured consumer products also, and would be an even more powerful factor except for the natural tendency toward caution on the part of rural buyers confronted with adverse reports from financial centers. Activity of some of the small steel fabricators in the northern Ohio area has been encouraging. From the steel industry's standpoint, however, this activity is being overshadowed by the poor showing of the automotive industry. Not much more than fill-in orders are expected from the Michigan plants over the next few months, since some of the steel is still on hand which was purchased last October for January use.

Fair-sized shipments of light finished steel products are being taken by a few seasonally active manufacturers

in this area. While the volume of new structural projects is light, the Main Avenue bridge superstructure, which will run close to 10,000 tons with the railings, is in the immediate future, with bids closing April 29.

Scrap quotations are down 50c. a ton in both the Youngstown and Cleveland districts this week after a long period of inactivity. The pig iron market is quiet, consumers showing very little interest in forward buying.

### **Pig Iron**

Further study of March pig iron shipments, which showed fair gains over February, reveals that they were improved to a much greater extent than shipments of foundry coke, indicating that the melt has not increased correspondingly and that depletion of inventories was responsible for the increased deliveries. Many foundries continue working on restricted schedules, lacking the active support of the automobile and railroad equipment industries.

### **Iron Ore**

Normally the iron ore price for the ensuing season is established about this time of year, based upon the first sale, but little interest is being shown in the subject at present owing to the poor rate of steel works activity and the large amounts of ore on hand at furnaces.

### **Sheets and Strip**

Demand for galvanized sheets has improved, due to seasonal requirements of agricultural areas. Miscellaneous buying of other sheet grades continues only fair. From the automotive industry it appears now that only fill-in orders can be expected over the next few months. Some manufacturers have failed to exhaust material purchased in October and which they

expected to use in January. On 26, 28 and 29 gage galvanized roofing and siding, jobbers and dealers are now receiving a functional allowance of \$4 per ton compared with the former \$2. In carload lots, the functional and quantity allowances have been interchanged, with the same net result as heretofore. Sellers of strip steel are making fair sized shipments to a few seasonally active manufacturers of lighter products. Household appliance sales in this area are reported off about 25 per cent so far this year compared with the same period of 1937.

### **Wire and Wire Products**

Merchant wire product sales continue very satisfactory and are more nearly normal than other steel mill products. While the spring movement of fence materials and nails will get under way this month in such areas as the Dakotas, Montana and Minnesota, the peak in these products was earlier this year than usual and within a short time will begin to taper off. A revision has been made in the jobber-dealer set-up, resulting in elimination of the 60,000-lb. bracket which was infrequently used. Modifications also have been made in l.c.l. extras. Manufacturers' wire sales have failed to register any notable advance in recent weeks. Only a few automotive releases have been received recently and other manufacturers continue to buy on a hand-to-mouth basis.

### **Bars, Plates and Shapes**

The fact that the railroads are doing only the most necessary buying, and very little of that, has been felt keenly in the bar, shape and plate markets. Activity of manufacturers of road building equipment, tractors and farm implements and other heavy machinery has been fair, but insufficient to fill the gap created by the carriers' absence. Current structural awards are in good volume over the nation, but new projects in this vicinity are light. Bids on the superstructure of the Main Avenue bridge, which will run close to 10,000 tons with the railings, will close April 29. At the same time, bids will close on the land piers involving 250 tons of reinforcing bars.



## REINFORCING STEEL

**... Awards of 1235 tons—  
8230 tons in new projects.**

### AWARDS

Lyons, N. J., 225 tons, Veterans Hospital to Ceco Steel Products, Omaha.

Roanoke, Va., 330 tons, Veterans Hospital, to unnamed bidder.

Chicago, 100 tons, Peoples Store, to Joseph T. Ryerson & Son, Inc., Chicago.

El Cerrito, Cal., 238 tons, school, to W. C. Hauck & Co., San Francisco.

Parco, Wyo., 169 tons, KeKndrick project, to Sheffield Steel Co., Kansas City.

Rutledge, Tex., 171 tons, Colorado River project (Invitation 46558A), to Southern States Steel Corp., Dallas, Tex.

### NEW REINFORCING BAR PROJECTS

Boston, 400 tons, Massachusetts General Hospital addition.

Hartford, Conn., 100 tons, Y.M.C.A. building.

Wassaic, N. Y., 100 tons, school.

Queens, N. Y., 500 tons, land section, East

River Tunnel; Charles F. Vachris, Inc., Brooklyn, low bidder.

Arkport, N. Y., 175 tons, dam No. 8.

Weehawken, N. J., 800 tons, approaches, Lincoln Tunnel, James Mitchell, Inc., New York, low bidder.

Newark, N. J., 100 tons, Passaic River bridge substructure; Senior & Palmer, Inc., New York, low bidders.

Lawn, Pa., 1000 tons, Maximum Security Prison for State.

Cleveland, 250 tons, bars for land piers, Main Avenue bridge; bids to be opened by Cuyahoga County Commissioners April 29.

Wauwatosa, Wis., 190 tons, high school; new bids April 8.

State of Wisconsin, 260 tons, 13 bridges; bids April 19.

St. Paul, Minn., 750 tons, filtration plant.

Nevada Creek, Mont., 100 tons, storage reservoir.

Mills, Wyo., 255 tons, Kendrick project (Invitation 22262A); Colorado Fuel & Iron Co., low bidder.

Corbett, Wyo., 453 tons, Shoshone project (Invitation 48129A); bids April 8.

Yakima County, Wash., 100 tons, Naches River highway bridge (FAP211-E); bids April 12.

Santa Barbara County, Cal., 201 tons, four highway bridges; bids April 20.

Los Angeles, 4234 tons, for United States Engineer; bids April 11.

to three days weekly to four and in a few cases five. In the agricultural implement sector, the melt has been holding up well.

Ingot operations in the St. Louis area are at 42 per cent of capacity.

The St. Louis Car Co. has been awarded 50 subway cars for the Interborough Rapid Transit Co., New York.

### Bids Asked for Four Cargo Ships

**B**IDS for construction of four cargo vessels for the American Export Lines, Inc., under terms of an agreement between the company and the Maritime Commission, have been asked by the commission. Shipbuilders may bid on from one to four vessels and no bid will be considered which fixes the time of completion of one ship beyond 450 days.

### Detroit Foundrymen Will Meet April 15-16

**U**NDER the joint sponsorship of the Detroit chapter of the American Foundrymen's Association and the mechanical engineering division of Michigan State College, a conference of foundry engineers and executives will be held on April 15 and 16. Discussions will deal primarily with casting defects and the value of modern equipment. Among the speakers scheduled to address the meeting are V. A. Crosby, H. W. Dietert, F. J. Walls, Pat Dwyer and Enrique Touceda.

### Scrap Group Makes Agreement with AFL

The labor committee of the Boston chapter of the Institute of Scrap Iron and Steel was authorized to enter into a labor agreement with the American Federation of Labor at a meeting of the chapter held at the Lenox Hotel in Boston March 31. The agreement provides a minimum wage of 40c. an hour and a 50-hr. week.

Milton Levenson, president of the chapter, who conducted the dinner meeting, which also discussed compensation insurance problems, announced the appointment of the following committees: labor, David Feinburg, chairman; entertainment, Morris Kafker, chairman; insurance, David Borowsky, chairman; traffic, William G. Mitchell, chairman; arbitration, B. Howard Lester, chairman.

## ...CINCINNATI...

**... Good demand for galvanized sheets; ingot output reduced.**

**C**INCINNATI, April 5.—Mills report little fluctuation in ordering of sheets, with galvanized sheets still leading. In fact, demand for galvanized is at about normal proportions. Except for small ordering of body sheets, the automotive demand is disappointing. Household equipment demand continues at the steady but reduced rate that has prevailed for the past month. Consumer attitude generally is one of hesitation, with obvious attention being focused on general business trends.

Ingot production will be off about eight points this week as one interest has cooled all its open hearths. Seven furnaces are in operation out of 34 in the district.

The pig iron market continues dull. Only occasional small purchases to fill in stocks are reported. Shipments are easing a bit since the quarter turn brought only minor changes in freight rates. Under these, No. 2 Northern

foundry iron is now quotable at \$24.44 a ton, Cincinnati, with Southern-38c. less. Malleable and bessemer are unchanged since these take a Hamilton basing point while foundry iron is on a Birmingham base. Foundry operations are without change, although a slight increase in castings demand is reported.

## ...ST. LOUIS...

**... Pig iron shipments showed large gain in March.**

**S**T. LOUIS, April 5.—Pig iron shipments in March were considerably ahead of those of February, one office showing a gain of 70 per cent. The outlook is said to be for heavy shipments during April. Some larger melters in the district have been forced to buy because of low inventories, one concern buying 2000 tons for shipment during this month. However, there is little forward buying and orders are mostly for a carload or so for immediate shipment and consumption.

There has been a pick-up in the melt of jobbing foundries, whose operations have been increased from two

## ...NEW YORK...

### ... Minor improvement of March flattens out.

o o o

### ... Manhattan bridge will take 1000 tons of plates.

o o o

### ... Interborough buys 50 subway cars; no other car buying.

NEW YORK, April 5.—The minor improvement that was in evidence in steel sales in this district during most of March has flattened out.

As a result of a slight increase in building activity, there has been a better market for light plate for stair work and fireproofing, also tanks, and there are a number of sizable public projects that will absorb plate tonnages. Floor reconstruction of the Manhattan bridge will require 1000 tons of plates, and an extension of the West Side elevated highway will bulk large in plates.

With the 50 I.R.T. subway cars awarded to the St. Louis Car Co., there is no new car business in sight and none is anticipated for some time. The same is true of locomotive orders. Shipbuilding has yet to become active, except for a steel company subsidiary yard, and the refinery equipment builders' requirements are still a minor factor.

#### Pig Iron

Although New England and New Jersey foundries are still working only three days a week on the average, there has been a pickup in the activity of Brooklyn jobbing foundries, most of which are now working four or five days a week. As a result, there has been some increase in ordering on the part of concerns in that section, with the average shipment running around 100 tons.

#### Sheets and Plates

Sheet business recorded a substantial upturn in March, and for some sellers, the trend is being continued. One district office reported a volume of orders last week equal to 75 per

cent of a normal week's bookings, but this condition is exceptional.

District of Columbia closed bids on April 4 on 272,000 lb. of hot rolled, pickled annealed sheets for automobile identification plates. Panama Canal is to open bids on April 18 on 30,000 lb. of No. 16 gage flat galvanized roofing sheets. On March 28, the same Government department opened bids on 54,000 lb. of No. 12 gage corrugated

roofing material, either galvanized or asbestos covered.

Sales of fabricated wire products, fencing and wire mesh have shown substantial gains to the jobbing trade in line with seasonal influences.

#### Reinforcing Bars

Sales in the past week were about 10 per cent higher than the preceding two weeks, due largely to a seasonal upswing in the volume of small industrial projects and road repair jobs. Most of this work is under 100 tons and is not included in the published list of bar awards. Tonnages consumed in projects amounting to more than 100 tons for the current year to date is about 34 per cent below a corresponding period in 1937. On April 11 the new freight tariffs go into effect and quotations in the Metropolitan district on lots of 15 to 20 tons will be advanced to 2.91c.

## ...GREAT BRITAIN...

### ... Continental steel market dull; prices are firmer.

LONDON, April 4 (By Cable).—The Continental steel market is still dull as export orders are few, but some inquiry has come from Egypt, South Africa and the Argentine. The price tendency is firmer following the Continental-American agreement and the suspension of lower prices previously permitting works to accept in order to meet American competition. Cartel committees met Thursday to discuss renewal of existing agreements. Further meetings are likely after Easter. The Belgian group has not yet signified its consent to the Cartel renewal.

Compared with this time last year, French steel works' orders are down 60 per cent. Since December 10 French blast furnaces have been damped or blown out.

British heavy steel works are busily engaged largely in armaments and likely to continue so, as the Admiralty has placed orders for eight destroyers valued at £3,000,000, but normal export business is still negligible.

## ....BUFFALO....

### ... Warehouses increase prices 3c. per 100 lb. on some items.

BUFFALO, April 5.—Warehouses increased prices during the week 3c. per 100 lb. on several items in connection with the recent rises in freight rates. This type of business showed an increase in March over February, but this was ascribed solely to seasonal requirements.

Pig iron business is holding up, March shipments having been about the same as in February. All of the business is in small lots for spot shipment with little future buying.

Frank Messer & Sons, Inc., Cincinnati, has the general contract for the erection of the Neisner, Inc., store in downtown Buffalo. A Buffalo maker will furnish 250 tons of steel piling for a Pennsylvania grade crossing job in Cheektowaga Township on the border of Buffalo.

Operations are off slightly with Wickwire-Spencer Steel Co. plant operating one open hearth instead of two. Other mills are operating as before.

# .. PHILADELPHIA ..

... *Seasonal gains reported in plate and galvanized sheet sales.*

° ° °

... *Structural lettings recede as State work ends.*

° ° °

... *Scrap market inactive; export price lowered \$1 a ton.*

PHILADELPHIA, April 5.—Mill representatives report a slight increase in the volume of plate and galvanized sheet sales during the past week. This gain is made up entirely of small-lot orders, carload sales being rare. This improvement would in normal times, be of no significance, but any buying that serves to break the calm that exists here at present naturally attracts considerable interest. Tank builders, small fabricators and jobbers are responsible for the gain in plate orders, while tinsmiths account for the bulk of the better demand for galvanized sheets.

Automobile parts fabricators are buying very little steel and are not expected to buy much for 1938 cars.

The extended absence of the railroads from the local market, together with the delay, occasioned by changes in design, in placing orders for the much discussed cargo boats, gives sellers here little hope of any real improvement in business in April or May.

Operations in this district have been reduced to the extent of one small furnace at a plate producer's plant. The tonnage involved in this reduction is too small to alter the rate of operations, which continues at 29 per cent of capacity.

Quotations on No. 1 melting steel for export have been lowered \$1 a ton on the basis of recent covering on a small export order. Domestic quotations on this grade are off 50c.

## **Pig Iron**

Casting operations are a shade better than in the preceding week, and, although sales have not shown a comparable increase, inquiries and specifications are in somewhat better volume. The better operating rates are particularly noticeable in independent jobbing foundries and soil pipe plants. Freight rates from Swedeland to

Philadelphia will not be affected by the recent increase.

## **Shapes and Reinforcing Bars**

The only new inquiry for the week is one covering material required for a school at Harrisburg, estimated at 1500 tons of shapes. When this job is placed the State institutional program will be completed. The absence of any suggestion of support from private sources leads sellers to predict an inactive summer. The culmination of the State program has also reduced the demand for reinforcing bars to a low level. A few private jobs, mostly in the nature of alterations, are still

# .. SAN FRANCISCO ..

... *Shasta Dam to take large steel tonnage; bids June 1*

SAN FRANCISCO, April 4.—Construction bids on Shasta Dam, principal unit in the Bureau of Reclamation's Central Valleys (Cal.) project and designed to be the world's second largest concrete dam, will be taken June 1 at Sacramento, Cal. Steel for the project, which involves approximately 13,000 tons of reinforcing bars, 6850 tons of penstocks and outlet pipes, and 18,500 tons of gates, valves and structural steel, will be bought by the Bureau of Reclamation as the work progresses, according to first reports. Negotiations are still under way with regard to the necessary relocation of 37 miles of Southern Pacific Railroad tracks. Bridges requiring 22,000 tons of shapes and 8000 tons of reinforcing bars will be built on the new right of way. Reported plans for the railroad to build all but the big Pitt River bridge are said to have changed. Highway relocation plans have not yet been announced.

pending, but these total at the most only 200 tons.

## **Plates**

Pending tonnages include 1400 tons for a gas holder for Waterbury, Conn., on which the Stacey Mfg. Co., Cincinnati, was low bidder, and about 1800 tons for a dredge being constructed by Pusey & Jones. Steel for the dredge is expected to be placed very shortly, and, according to past experience, will probably be allocated among four Eastern producers. The new l.c.l. freight rate from Coatsville is 19c., making prices on this quantity 2.54c., f.o.b. cars at Philadelphia yards. Carload rates are unchanged.

## **Sheets and Strip**

Spring repairs to homes and industrial plants have brought a slightly better demand for galvanized sheets through jobbers. Other outlets, however, are showing no interest in the market. Strip sales are very light.

## **Imports**

The following iron and steel imports were received here during the past week: 126 tons of ferromanganese from the Netherlands and 33 tons of pig iron from British India.

Apparent low bidders on 40 sets of conduit linings and 80 102-in. ring-seal gates for Grand Coulee Dam are: Items 1 and 2, Joshua Hendy Iron Works, San Francisco; items 3 and 4, Valley Iron Works, Yakima, Wash.; items 5 and 6, Lynchburg Foundries, East Radford, Va.; item 7, Consolidated Steel Co., Los Angeles. Total weight, according to preliminary rough estimates, is about 10,000 tons, a large portion of which is steel castings.

Five hundred tons of structural steel for Western Pacific Railroad shops at Sacramento, Cal., has been awarded to Columbia Steel Co., San Francisco. Cranes for the shops, requiring 139 tons of steel and 114 tons of machinery, have been awarded to the Whiting Corp., Harvey, Ill. A 250 hp. Babcock & Wilcox boiler will reportedly be purchased through C. C. Moore & Co., San Francisco.

Local domestic and export scrap steel activity continues light, but several shiploads have recently been sent from southern California and Pacific Northwest ports. Export tonnage from Pacific ports since Jan. 1 has been less than 40,000 tons.



# ...NON-FERROUS...

...Export copper demand develops in good volume.

...Liquidation abroad forces tin prices down sharply.

NEW YORK, April 5.—The past week was one of conflicting trends in the non-ferrous markets. Copper sales, both domestic and foreign, were in increased volume, while zinc buying dropped to 812 tons in the past week from 4500 tons in the preceding week. Pressure from abroad forced domestic tin prices into a sharp decline, while lead prices have shown added steadiness. On Friday

domestic buying of the red metal reached the 2500-ton mark, as compared with the usual daily total of around 1000 tons. On Monday, however, buying interest diminished considerably and sales dropped back to the 1000-ton level. Foreign buyers were more active last week than for some time past, with as much as 5000 tons being purchased in a day. This morning's foreign price of 9.59c. per lb.,

c.i.f., usual base ports, is 11 points below the previous day's price. Domestically, sellers continue to quote 10c. per lb., Connecticut Valley, on electrolytic metal.

## Tin

Over the past three months agitation for a buffer pool to level out fluctuations in prices has led to considerable speculative buying. Lately, however, it became obvious that the strength of the opposition to the pool was such as to render its adoption improbable. This realization brought on hurried liquidation of the speculative stocks and prices dropped 2.40c. per lb. between last Wednesday and today. Domestic consumers have been buying lightly in all positions on each decline. The average quotation for the five-day period ended today is 38.53c. against 40.95c. in the previous period. Cast standards in London were down to £168 this morning, as compared with £182 10s. a week ago.

## Zinc

Following an unexpected burst in sales to 4500 tons in the week ended March 26, sales in the past week dropped to 812 tons. Deliveries in comparable periods were 1000 tons and 3270 tons respectively. On Monday a round tonnage was sold at 4.15c. per lb., East St. Louis, 10 points below the previous day's price and this has been generally accepted by all sellers as the basis for current business. The London market has been moderately active all week. Sales this morning totaled 1600 tons at 2.99c. per lb., London, for prompt delivery and 3.04c. for future shipment.

## Lead

Sales last week were about a third greater than in the preceding week, with 80 per cent of the buying activity concentrated on April shipment. The requirements of the present month are approximately 50 per cent covered.

## Average Prices for Metals

The average prices of the major non-ferrous metals in March, based on the quotations appearing in THE IRON AGE, were as follows:

	Per lb.
Electrolytic copper, Connecticut Valley	10.00c.
Lake copper, Eastern delivery	10.125c.
Straits tin, spot, New York	41.159c.
Zinc, East St. Louis	4.416c.
Zinc, New York	4.773c.
Lead, St. Louis	4.35c.
Lead, New York	4.50c.

## The Week's Prices. Cents Per Pound for Early Delivery

	Mar. 30	Mar. 31	Apr. 1	Apr. 2	Apr. 4	Apr. 5
Electrolytic copper, Conn.*	10.00	10.00	10.00	10.00	10.00	10.00
Lake copper, N. Y.	10.125	10.125	10.125	10.125	10.125	10.125
Straits, tin, spot, New York	38.90	38.00	38.90		38.75	38.10
Zinc, East St. Louis	4.25	4.25	4.25	4.25	4.15	4.15
Zinc, New York	4.64	4.64	4.64	4.64	4.54	4.54
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50	4.50

\*Delivered Connecticut Valley; price ¼c. lower delivered in New York.  
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.  
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.  
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.  
Antimony, Asiatic, 15.75c. a lb., prompt, f.o.b. New York.  
Antimony, American, 13.75c. per lb., prompt shipment, New York.  
Quicksilver \$72.00 to \$73.50 per flask of 76 lb.  
Brass ingots, commercial 85-5-5-5, 10.25c. a lb., less carload, delivered in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

### From New York Warehouse

#### Delivered Prices, Base per Lb.

Tin, Straits pig	40.50c. to 41.50c.
Tin, bar	42.50c. to 43.50c.
Copper, Lake	11.00c. to 12.00c.
Copper, electrolytic	11.00c. to 12.00c.
Copper, castings	10.50c. to 10.75c.
*Copper sheets, hot-rolled	13.125c.
*High brass sheets	16.375c.
*Seamless brass tubes	19.125c.
*Seamless copper tubes	18.625c.
*Brass rods	12.375c.
Zinc, slabs	6.25c. to 7.25c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	11.00c.
Lead, American pig	5.50c. to 6.50c.
Lead, bar	6.625c. to 7.625c.
Lead, sheets, cut	7.75c.
Antimony, Asiatic	16.00c. to 17.00c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	29.00c. to 31.00c.
Babbitt metal, commercial grade	20.00c. to 50.00c.

\*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.

### From Cleveland Warehouse

#### Delivered Prices per Lb.

Tin, Straits pig	42.75c.
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Tin, bar	44.75c.
Copper, Lake	11.00c. to 11.25c.
Copper, electrolytic	11.00c. to 11.25c.
Copper, castings	10.75c.
Zinc, slabs	7.25c. to 7.50c.
Lead, American pig	5.00c. to 5.25c.
Lead, bar	8.25c.
Antimony, Asiatic	18.50c.
Babbitt metal, medium grade	18.00c.
Babbitt metal, high grade	46.75c.
Solder, ½ and ½	25.25c.

## Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.625c.	8.375c.
Copper, hvy. and wire	6.875c.	7.375c.
Copper, light and bottoms	6.125c.	6.375c.
Brass, heavy	4.125c.	4.75c.
Brass, light	3.375c.	4.125c.
Hvy. machine composition	6.625c.	7.125c.
No. 1 yel. brass turnings	4.375c.	4.875c.
No. 1 red brass or compos. turnings	6.25c.	6.75c.
Lead, heavy	3.625c.	4.00c.
Cast aluminum	7.75c.	9.00c.
Sheet aluminum	11.50c.	13.00c.
Zinc	2.375c.	3.625c.

# IRON AND STEEL SCRAP

*... Absence of new export orders is tending to weaken domestic market.*

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*... Composite off 34c. to \$12.83, year's low point thus far.*

**A**PRIL 5.—Despite the almost complete lack of mill purchases for months, market prices for scrap have held up to levels unheard of in 1931 and 1932 when the ingot rate was comparable with that at present. Explanation, of course, is the high rate of export activity. It now appears, however, that this activity is coming abruptly to an end and some of the support export buying has given the domestic market is being relieved. With no new orders in sight, export buying prices at New York are off as much as \$2 a ton and at Philadelphia, \$1. With foreign influences diminishing, prices at Pittsburgh are off 50c., with similar declines at Philadelphia, Cleveland, Buffalo, Detroit and Cincinnati, although not all for the same reason. The new Buffalo prices are based on a recent sale of 8000 tons of No. 1 steel to a local mill. Although the undertone of the domestic market at Philadelphia is softer, there has been no change in domestic prices as yet, and at Chicago prices are nominally unchanged in view of new sales. As a result, the composite has declined 34c. to \$12.83, representing a new low point thus far in 1938 and lower than at any period in 1937. With ingot operations wavering and mills tending to reduce their ore inventories by putting more hot iron into the melt, and with the export prop removed, further price declines seem inevitable.

## **Pittsburgh**

With foreign influences diminishing, continuation of irregular operating rates, the intent of steel mills to use as much iron ore as possible, and the offering by at least two brokers of No. 1 heavy melting steel to a consumer at a delivered price of \$13 a ton, No. 1 heavy melting steel is off 50c. this week to \$12.75 to \$13.25, making an average price of \$13 a ton. In the absence of definite sales, this appraisal reflects the current situation. Other open-hearth grades are off in sympathy. There is a less independent attitude on the part of the yard dealers noted recently. The fact that large steel makers are intent on reducing iron ore stocks precludes the possibility of heavy scrap buying in the near future.

## **Chicago**

Although there is a slight possibility that some mill purchases may be seen be-

fore long, the current situation is unchanged and mill interest is no greater. Shipments are being made only to two local mills and they are at a recently reduced rate. The Wabash and Alton roads have lists out this week containing about 1000 tons of No. 1 steel each, while the North Western closed last week on a list and decided not to sell on a reported top bid for steel of \$11.75 per gross ton delivered.

## **Philadelphia**

The undertone of the domestic market is noticeably softer, probably due to the influence of a recent dealer purchase of a small tonnage of No. 1 melting steel for export at \$13. On the basis of this activity export prices have been revised downward \$1 a ton and domestic prices for steel making grades 50c. The domestic market is receiving very little support from mill sources and in more than one instance consumers have requested a delay in the delivery of purchased material.

## **New York**

As predicted last week, export buying prices took another sharp downward turn and by April 4 dealers' buying prices were off as much as \$2 a ton. These changes were not made uniformly by all brokers, nor on the same items. The range on No. 1 steel is now \$11.50 to \$12, in place of a flat \$12.50 last week. Although the price for No. 2 is down \$1 to \$10, one broker is still offering \$11, but has lowered his buying price \$2 on stove plate, where others have lowered only \$1. No. 2 cast is off \$1. The present move is not at all surprising in view of the rapidity of the decline in export activity. Had it been foreseen, buying on the last orders would have proceeded at a much slower pace. As it is now, all this material has been bought, although not all shipped, and the prospects of new business is not encouraging, either from Europe or the Orient. Meanwhile, domestic buying is still absent and prices for material on cars purely nominal.

## **Cleveland**

No. 1 heavy melting steel at Youngstown is off 50c. to \$12 to \$12.50, and sympathetically No. 1 at Cleveland is off the same amount to \$11 to \$11.50 per ton after a long period of inactivity. The weakness in the Valleys district has had an adverse effect upon all open-hearth grades and it is the consensus that reductions in quotations are fully justified at this time. Very little attention is being paid to the current monthly railroad lists, many dealers believing that the materials offered can be classified as "feelers" and that most of the scrap will go for export. There is still no sign of mill buying in the Cleveland district, since ingot output

continues to lag. The decision of steel producers to return a number of reject grades to the open hearths was first made known Feb. 10 and the plan has been in operation since then.

## **Buffalo**

A Buffalo mill whose last purchase of No. 1 heavy melting steel had been at \$13, dropped its price to \$12.50 and acquired about 8000 tons. In line with its usual buying policy, little of this tonnage was No. 1 steel, but it served as a base for No. 2 steel which was taken in at \$10.50; new hydraulic bundles at \$11; old bundles at \$9.50. No machine shop turnings were included in this sale, which may no longer be shipped, except by separate contract. The price consequently on this item has weakened, somewhat below this consumer's usual differential of \$6 below No. 1 steel.

## **St. Louis**

Dealers expect that negotiations with a district mill for the purchase of a sizable tonnage of melting steel scrap will be closed during this or the next week. Inventories of mills are said to be quite low. The Missouri Pacific Railway has a list of 70 carloads, which probably will be sold to local interests, but a list of nine carloads issued by the New York Central Lines will likely go to other markets. Prices of bundled sheets, rails for rolling, railroad malleable and No. 1 machinery cast were 50c. a ton lower.

## **Cincinnati**

The scrap market is steadily dull with trading confined to small, almost inconsequential deals. Bids on yard scrap have decreased further as dealers become wary of long positions. Mills are without interest in purchases.

## **Detroit**

Reductions of about 50c. a ton were effected in most items in the Detroit scrap market as a result of the closing of some automotive lists in the last week. The downward movement, however, was not as precipitous as was expected. In the face of this weakness, unforeseen support from an out-of-town mill made the bundle market uncertain. Borings and turnings have shown exceptional weakness in some sales. The market on cast iron has become very uncertain as a result of the dilatory schedule in connection with the automotive die programs. If, as feared, the 1939 model changes are curtailed, all the foundry items will drop within a few weeks. It is generally conceded.

## **Boston**

Domestic steel mills are not purchasing scrap, and the export market has quieted down somewhat, due to a lack of new foreign orders. Exporters are now of the opinion that foreign countries are pretty well stocked with scrap, and that unless something unexpected happens, the next buying movement will originate at domestic points. Nos. 1 and 2 steel for export are unchanged at \$13 and \$12 a ton delivered dock, respectively.



# Iron and Steel Scrap Prices

## PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$12.75 to \$13.25
Railroad hvy. mtng.	14.00 to 14.50
No. 2 hvy. mtng. steel	11.50 to 12.00
Scrap rails	15.00 to 15.50
Rails 3 ft. and under.	17.50 to 18.00
Comp. steel steel.	12.75 to 13.25
Hand bundled sheets.	11.75 to 12.25
Hvy. steel axle turn.	11.25 to 11.75
Machine shop turn.	7.50 to 8.00
Short shov. turn.	7.50 to 8.00
Mixed bor. & turn.	6.00 to 6.50
Cast iron borings	6.00 to 6.50
Cast iron carwheels.	14.50 to 15.00
Hvy. breakable cast.	12.00 to 12.50
No. 1 cupola cast.	14.50 to 15.00
RR. knuckles & clips.	17.25 to 17.75
Rail coil & leaf springs	17.25 to 17.75
Rolled steel wheels.	17.25 to 17.75
Low phos. billet crops.	17.75 to 18.25
Low phos. sh. bar.	17.25 to 17.75
Low phos. punchings.	16.00 to 16.50
Low phos. plate, hvy.	16.50 to 17.00
Low phos. plate clips.	14.50 to 15.00
Steel car axles	17.00 to 17.50

## PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$13.50 to \$14.00
No. 2 hvy. mtng. steel.	12.00 to 12.50
Hydraulic bund., new.	13.50 to 14.00
Hydraulic bund., old.	9.50 to 10.00
Steel rails for rolling.	16.00 to 16.50
Cast iron carwheels.	15.50 to 16.00
Hvy. breakable cast.	14.50 to 15.00
No. 1 cast	15.50 to 16.00
Stove plate (steel wks.)	12.50 to 13.00
Railroad malleable	15.00 to 15.50
Machine shop turn.	7.00 to 7.25
No. 1 blast furnace.	6.00 to 6.50
Cast borings	6.00 to 6.50
Heavy axle turnings.	10.50 to 11.00
No. 1 low phos. hvy.	17.50 to 18.00
Couplers & knuckles.	17.00 to 17.50
Rolled steel wheels.	17.00 to 17.50
Steel axles	20.00 to 20.50
Shafting	19.00 to 19.50
No. 1 RR. wrought.	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire.	11.00 to 11.50
Cast borings (chem.).	12.50 to 13.00

## CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton

Hvy. mtng. steel	\$11.50 to \$12.00
Auto. hvy. mtng. steel alloy free	10.00 to 10.50
No. 2 auto. steel	9.50 to 10.00
Shoveling steel	11.50 to 12.00
Hydraul. comp. sheets	10.50 to 11.00
Drop forge flashings	9.25 to 9.75
No. 1 busheling	10.25 to 10.75
No. 2 busheling, old.	4.75 to 5.25
Rolled carwheels	14.00 to 14.50
Railroad tires, cut.	15.50 to 16.50
Railroad leaf springs	15.00 to 15.50
Steel coup. & knuckles	14.00 to 14.50
Axle turnings	11.00 to 11.50
Coil springs	16.00 to 16.50
Axle turn. (elec.)	11.00 to 11.50
Low phos. punchings.	15.00 to 15.50
Low phos. plates, 12 in. and under	14.00 to 14.50
Cast iron borings	4.50 to 5.00
Short shov. turn.	6.00 to 6.50
Machine shop turn.	4.50 to 5.00
Rerolling rails	14.75 to 15.25
Steel rails under 3 ft.	15.00 to 15.50
Steel rails under 2 ft.	15.50 to 16.00
Angle bars, steel.	13.50 to 14.00
Cast iron carwheels.	13.25 to 13.75
Railroad malleable	12.75 to 13.25
Agric. malleable	11.50 to 12.00

Per Net Ton

Iron car axles	\$17.50 to \$18.00
Steel car axles	16.00 to 16.50
No. 1 RR. wrought.	9.00 to 9.50
No. 2 RR. wrought	10.25 to 10.75
Locomotive tires	15.25 to 15.75
Pipes and flues	8.75 to 9.25
No. 1 machinery cast.	11.00 to 11.50
Clean auto. cast.	10.75 to 11.25
No. 1 railroad cast.	10.25 to 10.75
No. 1 agric. cast.	10.00 to 10.50
Stove plate	8.00 to 8.50
Grate bars	8.00 to 8.50
Brake shoes	7.50 to 8.00

## YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$12.00 to \$12.50
Hydraulic bundles	11.50 to 12.00
Machine shop turn.	8.50 to 9.00

## CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$11.00 to \$11.50
No. 2 hvy. mtng. steel.	10.00 to 10.50
Comp. sheet steel	10.50 to 11.00
Light bund. stampings.	7.50 to 8.00
Drop forge flashings.	10.00 to 10.50
Machine shop turn.	6.50 to 7.00
Short shov. turn.	6.75 to 7.25
No. 1 busheling	10.00 to 10.50
Steel axle turnings	9.00 to 9.50
Low phos. billet and bloom crops	17.00 to 17.50
Cast iron borings	7.00 to 7.50
Mixed bor. & turn.	7.00 to 7.50
No. 2 busheling	7.00 to 7.50
No. 1 cast	15.00 to 15.50
Railroad grate bars	7.00 to 7.50
Stove plate	7.00 to 7.50
Rails under 3 ft.	16.50 to 17.00
Rails for rolling	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Cast iron carwheels.	14.00 to 14.50

## BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mtng. steel.	\$12.00 to \$12.50
No. 2 hvy. mtng. steel.	10.00 to 10.50
Scrap rails	14.00 to 14.50
New hvy. b'ndled sheets	10.50 to 11.00
Old hydraul. bundles.	9.00 to 9.50
Drop forge flashings.	10.00 to 10.50
No. 1 busheling	10.00 to 10.50
Hvy. axle turnings.	10.00 to 10.50
Machine shop turn.	5.75 to 6.25
Knuckles & Couplers.	15.50 to 16.00
Coil & leaf springs.	15.50 to 16.00
Rolled steel wheels.	15.50 to 16.00
Low phos. billet crops.	16.50 to 17.00
Shov. turnings	7.50 to 8.00
Mixed bor. & turn.	6.00 to 6.50
Cast iron borings.	6.00 to 6.50
Steel car axles	15.50 to 16.00
No. 1 machinery cast.	14.50 to 15.00
No. 1 cupola cast.	13.00 to 13.50
Stove plate	11.00 to 11.50
Steel rails under 3 ft.	17.00 to 17.50
Cast iron carwheels.	13.50 to 14.00
Railroad malleable	13.00 to 13.50
Chemical borings	9.00 to 9.50

## ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	\$11.50 to \$12.00
No. 1 hvy. melting.	11.50 to 12.00
No. 2 hvy. melting.	10.50 to 11.00
No. 1 locomotive tires.	12.50 to 13.00
Misc. stand. sec. rails.	12.00 to 12.50
Railroad springs	14.50 to 15.00
Bundled sheets	8.50 to 9.00
No. 1 busheling	7.00 to 7.50
Cast bor. & turn.	5.00 to 5.50
Rails for rolling	13.50 to 14.00
Machine shop turn.	4.00 to 4.50
Heavy turnings	8.50 to 9.00
Steel car axles	19.50 to 20.00
Iron car axles	21.50 to 22.00
No. 1 RR. wrought.	8.00 to 8.50
No. 2 RR. wrought.	11.50 to 12.00
Steel rails under 3 ft.	14.00 to 14.50
Steel angle bars	13.00 to 13.50
Cast iron carwheels.	12.50 to 13.00
No. 1 machinery cast.	11.50 to 12.00
Railroad malleable	12.50 to 13.00
No. 1 railroad cast.	11.50 to 12.00
Stove plate	8.50 to 9.00
Agricul. malleable	10.00 to 10.50
Grate bars	9.00 to 9.50
Brake shoes	9.00 to 9.50

## CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mtng. steel.	\$8.50 to \$9.00
No. 2 hvy. mtng. steel.	6.50 to 7.00
Scrap rails for mtng.	13.50 to 14.00
Loose sheet clippings.	4.50 to 5.00
Hydraul. b'ndled sheets	8.00 to 8.50
Cast iron borings	2.50 to 3.00
Machine shop turn.	3.00 to 3.50
No. 1 busheling	7.00 to 7.50
No. 2 busheling	2.00 to 2.50
Rails for rolling	15.50 to 16.00
No. 1 locomotive tires.	12.00 to 12.50
Short rails	16.00 to 16.50
Cast iron carwheels.	10.50 to 11.00
No. 1 machinery cast.	10.50 to 11.00
No. 1 railroad cast.	9.00 to 9.50
Burnt cast.	5.50 to 6.00
Stove plate	5.50 to 6.00
Agricul. malleable	10.00 to 10.50
Railroad malleable	12.00 to 12.50
Mixed hvy. cast.	7.50 to 8.00

## BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel.	\$11.50 to \$12.00
Scrap steel rails	14.00 to 14.50
Short shov. turnings.	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought.	10.00
Rails for rolling	15.00 to 16.00
No. 1 cast	14.00 to 16.50
Tramcar wheels	14.00 to 15.00

## DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mtng. steel.	\$7.00 to \$7.50
No. 2 hvy. mtng. steel.	6.00 to 6.50
Borings and turnings.	3.50 to 4.00
Long turnings	3.50 to 4.00
Short shov. turnings.	4.50 to 5.00
No. 1 machinery cast.	11.75 to 12.25
Automotive cast	12.75 to 13.25
Hvy. breakable cast.	10.00 to 10.50
Hydraul. comp. sheets.	8.50 to 9.00
Stove plate	6.75 to 7.25
New factory bushel.	6.50 to 7.00
Old No. 2 busheling.	3.50 to 4.00
Sheet clippings	4.50 to 5.00
Flashings	6.50 to 7.00
Low phos. plate scrap.	8.50 to 9.00

## NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mtng. steel.	\$10.00 to \$10.50
No. 2 hvy. mtng. steel.	8.50 to 9.00
Hvy. breakable cast.	10.00 to 10.50
No. 1 machinery cast.	11.50 to 12.00
No. 2 cast	9.00 to 9.50
Stove plate	8.50 to 9.00
Steel car axles	20.00 to 20.50
Shafting	16.00 to 16.50
No. 1 RR. wrought.	11.50 to 12.00
No. 1 wrought long.	10.00 to 10.50
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings.	3.00 to 3.50
Cast borings	3.00 to 3.50
No. 1 blast furnace.	3.00 to 3.50
Cast borings (chem.).	9.50 to 10.00
Unprepared yard scrap	7.00 to 7.50
Light iron	3.50 to 4.00

Per gross ton delivered local foundries:

No. 1 machn. cast.	\$15.50 to \$16.00
No. 2 cast	13.00 to 13.50

\*\$1.50 less for truck loads.

## BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mtng. steel.	\$13.30 to \$13.80
Scrap rails	13.30 to 13.80
No. 2 steel	12.30 to 12.80
Breakable cast	9.75
Machine shop turn.	2.40
Mixed bor. & turn.	2.40
Bun. skeleton long.	6.50
Shafting	17.00 to 17.50
Cast bor. chemical.	6.00 to 6.50

Per gross ton delivered consumers' yards:

Textile cast	15.00 to 15.50
No. 1 machine cast.	15.00 to 15.50

## PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$11.65 to \$12.15
No. 2 hvy. mtng. steel.	10.65 to 11.15

## CANADA

Dealers' buying prices at their yards, per gross ton:

Toronto Montreal	
No. 1 hvy. mtng. steel.	\$10.50 \$9.50
No. 2 hvy. mtng. steel.	9.50 8.50
Mixed dealers steel.	8.50 7.50
Scrap pipe	8.50 7.50
Steel turnings	7.50 7.00
Cast borings	8.50 7.50
Machinery cast	15.00 14.00
Dealers cast	13.00 12.00
Stove plate	11.00 10.50

## EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges

No. 1 hvy. mtng. steel.	\$11.50 to \$12.00
No. 2 hvy. mtng. steel.	10.00 to 11.00
No. 2 cast	9.50 to 10.00
Stove plate	7.00 to 8.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mtng. steel.	\$12.50
No. 2 hvy. mtng. steel.	11.50
Rails (scrap)	12.50

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mtng. steel.	\$13.00 to \$13.50
No. 2 hvy. mtng. steel.	11.50 to 12.00



# PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

## SEMI-FINISHED STEEL

### Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton  
Rerolling .....\$37.00  
Forging quality ..... 43.00

### Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton  
Open-hearth or Besse-mer .....\$37.00

### Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.  
Grooved, universal and sheared .....2.10c.

### Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton  
F.o.b. Pittsburgh or Cleveland.....\$47.00  
F.o.b. Chicago, Youngstown or Anderson, Ind. .... 48.00  
F.o.b. Worcester, Mass. .... 49.00  
F.o.b. Birmingham ..... 50.00  
F.o.b. San Francisco ..... 56.00  
F.o.b. Galveston ..... 55.00  
Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

## BARS, PLATES, SHAPES

### Iron and Steel Bars

#### Soft Steel

Base per Lb.  
F.o.b. Pittsburgh ..... 2.45c.  
F.o.b. Chicago or Gary ..... 2.50c.  
F.o.b. Duluth ..... 2.60c.  
Del'd Detroit ..... 2.60c.  
F.o.b. Cleveland ..... 2.50c.  
F.o.b. Buffalo ..... 2.55c.  
Del'd Philadelphia ..... 2.77c.  
Del'd New York ..... 2.81c.  
F.o.b. Birmingham ..... 2.60c.  
F.o.b. cars dock Gulf ports ..... 2.85c.  
F.o.b. cars dock Pacific ports ..... 3.00c.

#### Rail Steel

(For merchant trade)

F.o.b. Pittsburgh ..... 2.30c.  
F.o.b. Cleveland, Chicago, Gary or Moline, Ill. .... 2.35c.  
F.o.b. Buffalo ..... 2.40c.  
F.o.b. Birmingham ..... 2.45c.  
F.o.b. cars dock Gulf ports ..... 2.70c.  
F.o.b. cars dock Pacific ports ..... 2.85c.

#### Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh ..... 2.45c.  
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham ..... 2.50c.  
Del'd Detroit ..... 2.60c.  
F.o.b. cars dock Gulf ports ..... 2.85c.  
F.o.b. cars dock Pacific ports ..... 2.95c.

#### Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh ..... 2.30c.  
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham ..... 2.35c.  
F.o.b. cars dock Gulf ports ..... 2.70c.  
F.o.b. cars dock Pacific ports ..... 2.80c.

### Iron

F.o.b. Chicago ..... 2.40c.  
F.o.b. Pittsburgh (refined) ..... 3.60c.

#### Cold Finished Bars and Shafting\*

Base per Lb.  
F.o.b. Pittsburgh ..... 2.90c.  
F.o.b. Cleveland, Chicago and Gary ..... 2.95c.  
F.o.b. Buffalo ..... 3.00c.  
F.o.b. Detroit ..... 2.95c.

\* In quantities of 10,000 to 19,999 lb.

### Plates

Base per Lb.  
F.o.b. Pittsburgh ..... 2.25c.  
F.o.b. Chicago or Gary ..... 2.30c.  
Del'd Cleveland ..... 2.45c.  
F.o.b. Coatesville or Spar. Pt. .... 2.35c.  
Del'd Philadelphia ..... 2.445c.  
Del'd New York ..... 2.55c.

F.o.b. Birmingham ..... 2.40c.  
F.o.b. cars dock Gulf ports ..... 2.65c.  
F.o.b. cars dock Pacific ports ..... 2.80c.  
Wrought iron plates, f.o.b. Pittsburgh ..... 3.80c.

### Floor Plates

F.o.b. Pittsburgh ..... 3.50c.  
F.o.b. Chicago ..... 3.55c.  
F.o.b. Coatesville ..... 3.60c.  
F.o.b. cars dock Gulf ports ..... 3.90c.  
F.o.b. cars dock Pacific ports ..... 4.05c.

### Structural Shapes

Base per Lb.  
F.o.b. Pittsburgh ..... 2.25c.  
F.o.b. Chicago ..... 2.30c.  
Del'd Cleveland ..... 2.45c.  
F.o.b. Buffalo or Bethlehem ..... 2.35c.  
Del'd Philadelphia ..... 2.465c.  
Del'd New York ..... 2.52c.  
F.o.b. Birmingham (standard) ..... 2.40c.  
F.o.b. cars dock Gulf ports ..... 2.65c.  
F.o.b. cars dock Pacific ports ..... 2.80c.

### Steel Sheet Piling

Base per Lb.  
F.o.b. Pittsburgh ..... 2.60c.  
F.o.b. Chicago or Buffalo ..... 2.70c.  
F.o.b. cars dock Gulf or Pacific Coast ports ..... .05c.

## RAILS AND TRACK SUPPLIES

### F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton .....\$42.50  
Angle bars, per 100 lb. .... 2.80

### F.o.b. Basing Points

Light rails (from billets) per gross ton .....\$43.00  
Light rails (from rail steel) per gross ton ..... 42.00

Base per Lb.  
Spikes ..... 3.15c.  
Tie plates, steel ..... 2.30c.  
Tie plates, Pacific Coast ports ..... 2.40c.  
Track bolts, to steam railroads ..... 4.35c.  
Track bolts, to jobbers, all sizes (per 100 counts) ..... 65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapolis, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

## SHEETS, STRIP, TIN PLATE

### TERNE PLATE

#### Sheets

#### Hot Rolled

Base per Lb.  
No. 10 f.o.b. Pittsburgh ..... 2.40c.  
No. 10, f.o.b. Gary ..... 2.50c.  
No. 10, del'd Detroit ..... 2.60c.  
No. 10, del'd Philadelphia ..... 2.72c.  
No. 10, f.o.b. Granite City ..... 2.60c.  
No. 10, f.o.b. Birmingham ..... 2.55c.  
No. 10, f.o.b. cars dock Pacific ports ..... 2.95c.  
No. 10, wrought iron, P'gh. .... 4.25c.

#### Hot Rolled Annealed

No. 24, f.o.b. Pittsburgh ..... 3.15c.  
No. 24, f.o.b. Gary ..... 3.25c.  
No. 24, del'd Detroit ..... 3.35c.  
No. 24, del'd Philadelphia ..... 3.47c.  
No. 24, f.o.b. Granite City ..... 3.35c.  
No. 24, f.o.b. Birmingham ..... 3.30c.  
No. 24, f.o.b. cars dock Pacific ports ..... 3.80c.  
No. 24, wrought iron, Pittsburgh ..... 5.15c.

#### Heavy Cold Rolled\*

No. 10 gage, f.o.b. Pittsburgh ..... 3.00c.  
No. 10 gage, f.o.b. Gary ..... 3.10c.  
No. 10 gage, f.o.b. Detroit ..... 3.20c.  
No. 10 gage, del'd Philadelphia ..... 3.32c.  
No. 10, f.o.b. Granite City ..... 3.20c.  
No. 10 gage, f.o.b. Birmingham ..... 3.15c.  
No. 10 gage, f.o.b. cars dock Pacific ports ..... 3.60c.

#### Light Cold Rolled\*

No. 20 gage, f.o.b. Pittsburgh ..... 3.45c.  
No. 20 gage, f.o.b. Gary ..... 3.55c.  
No. 20 gage, del'd Detroit ..... 3.65c.  
No. 20 gage, del'd Philadelphia ..... 3.77c.  
No. 20 f.o.b. Granite City ..... 3.65c.  
No. 20 gage, f.o.b. Birmingham ..... 3.60c.  
No. 20 gage, f.o.b. cars, dock Pacific ports ..... 4.00c.

\* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

#### Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh ..... 3.80c.  
No. 24, f.o.b. Gary ..... 3.90c.  
No. 24, del'd Philadelphia ..... 4.10c.

No. 24, f.o.b. Granite City ..... 4.00c.  
No. 24, f.o.b. Birmingham ..... 3.95c.  
No. 24, f.o.b. cars dock, Pacific ports ..... 4.40c.  
No. 24, wrought iron, Pittsburgh ..... 6.10c.

### Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.  
Field grade ..... 3.35c.  
Armature ..... 3.70c.  
Electrical ..... 4.20c.  
Special Motor ..... 5.10c.  
Special Dynamo ..... 5.80c.  
Transformer ..... 6.30c.  
Transformer Special ..... 7.30c.  
Transformer Extra Special ..... 7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

### Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh ..... 4.10c.  
F.o.b. Gary ..... 4.20c.  
F.o.b. cars dock, Pacific ports ..... 4.80c.

### Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh ..... 3.50c.  
No. 20, f.o.b. Gary ..... 3.60c.  
No. 20, f.o.b. Granite City ..... 3.70c.  
No. 20, f.o.b. cars dock Pacific ports ..... 4.10c.

### Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb. .... 3.30c.  
No. 28, Gary ..... 3.40c.  
No. 28, f.o.b. Granite City ..... 3.50c.  
No. 28, cars dock Pacific ports, boxed ..... 4.175c.

### Tin Plate

Base per Box  
Standard cokes, f.o.b. Pittsburgh district mill .....\$5.35  
Standard cokes, f.o.b. Gary ..... 5.45  
Standard coke, f.o.b. Granite City ..... 5.55

### Special Coated Manufacturing Ternes

Base per Box  
F.o.b. Pittsburgh .....\$4.65  
F.o.b. Gary ..... 4.75  
F.o.b. Granite City ..... 4.85

### Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)  
8-lb. coating I.C. ....\$12.00  
15-lb. coating I.C. .... 14.00  
20-lb. coating I.C. .... 15.00  
25-lb. coating I.C. .... 16.00  
30-lb. coating I.C. .... 17.25  
40-lb. coating I.C. .... 19.50

### Hot-rolled Hoops, Bands, Strip and Flats under 1/4 In.

Base per Lb.  
All widths up to 24 in., Pittsburgh ..... 2.40c.  
All widths up to 24 in., Chicago ..... 2.50c.  
All widths up to 24 in., del'd Detroit ..... 2.60c.  
All widths up to 24 in., Granite City ..... 2.60c.  
All widths up to 24 in., Birmingham ..... 2.55c.  
Cooperage stock, Pittsburgh ..... 2.50c.  
Cooperage stock, Chicago ..... 2.60c.

### Cold Rolled Strip\*

Base per Lb.  
F.o.b. Pittsburgh ..... 3.20c.  
F.o.b. Cleveland ..... 3.20c.  
Del'd Chicago ..... 3.49c.  
F.o.b. Worcester ..... 3.40c.

\* Carbon 0.25 and less.

### Cold Rolled Spring Steel

Pittsburgh and Cleveland Worcester  
Carbon 0.25-0.50% ..... 3.20c. 3.40c.  
Carbon .51-.75 ..... 4.45c. 4.65c.  
Carbon .76-1.00 ..... 6.30c. 6.50c.  
Carbon Over 1.00 ..... 8.50c. 8.70c.

### Commodity Cold Rolled Strip

No. 14, Pitts'gh or Cleveland ..... 3.35c.  
No. 14, Worcester ..... 3.75c.  
No. 20, Pitts'gh or Cleveland ..... 3.75c.  
No. 20, Worcester ..... 4.15c.

## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

### To Manufacturing Trade

	Per Lb.
Bright wire .....	2.90c.
Galvanized wire .....	2.95c.
Spring wire .....	3.50c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$3 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.	

### To the Trade

	Base per Keg
Standard wire nails .....	\$2.75
Smooth coated nails .....	2.75
Cut nails, carloads .....	3.60

### Base per 100 Lb.

Annealed fence wire .....	\$3.15
Galvanized fence wire .....	3.55
Polished staples .....	3.45
Galvanized staples .....	3.70
Barbed wire, galvanized .....	3.40
Twisted barbed wire .....	3.40
Woven wire fence, base column. 75	
Single loop bale ties, base col. 63	
Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.	

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

## STEEL AND WROUGHT IRON PIPE AND TUBING

### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

### Butt Weld

In.	Steel Black Galv.	In.	Wrought Iron Black Galv.
1/4	52 31	1/4 & 3/8	+13 +35
1/2	55 38 1/2	1/2	20 1 1/2
3/4	59 1/2 49	3/4	26 8
1	62 1/2 53	1 & 1 1/4	30 14
1 to 3	64 1/2 55 1/2	1 1/2	34 16 1/2
		2	33 1/2 16

### Lap Weld

2	57 47 1/2	2	26 1/2 10
2 1/2 & 3	60 50 1/2	2 1/2 to 3 1/2	27 1/2 12 1/2
3 1/2 to 6	62 52 1/2	4	29 1/2 16
7 & 8	61 50 1/2	4 1/2 to 8	28 1/2 15
9 & 10	60 1/2 50	9 to 12	24 1/2 10
11 & 12	59 1/2 49		

In.	Steel Black Galv.	In.	Wrought Iron Black Galv.
1/4	52 31	1/4 & 3/8	+13 +35
1/2	55 38 1/2	1/2	20 1 1/2
3/4	59 1/2 49	3/4	26 8
1	62 1/2 53	1 & 1 1/4	30 14
1 to 3	64 1/2 55 1/2	1 1/2	34 16 1/2
		2	33 1/2 16

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

### Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold Drawn	Hot Rolled
1 in. o.d. ....	13 B.W.G. \$ 9.46	\$ 8.41
1 1/4 in. o.d. ....	13 B.W.G. 11.21	6.96
1 1/2 in. o.d. ....	13 B.W.G. 12.38	11.00
1 3/4 in. o.d. ....	13 B.W.G. 14.09	12.51
2 in. o.d. ....	13 B.W.G. 15.78	14.02
2 1/4 in. o.d. ....	13 B.W.G. 17.60	15.63
2 1/2 in. o.d. ....	12 B.W.G. 19.37	17.21
2 3/4 in. o.d. ....	12 B.W.G. 21.22	18.85
3 in. o.d. ....	12 B.W.G. 22.49	19.98
3 1/2 in. o.d. ....	12 B.W.G. 23.60	20.97
4 in. o.d. ....	10 B.W.G. 45.19	40.15
4 1/2 in. o.d. ....	11 B.W.G. 29.79	26.47
5 in. o.d. ....	10 B.W.G. 36.96	22.83
5 1/2 in. o.d. ....	9 B.W.G. 56.71	50.38
6 in. o.d. ....	7 B.W.G. 87.07	77.35

### Extra for less-carload quantities:

40,000 lb. or ft. or over .....	Base
30,000 lb. or ft. to 39,999 lb. or ft. ....	5%
20,000 lb. or ft. to 29,999 lb. or ft. ....	10%
10,000 lb. or ft. to 19,999 lb. or ft. ....	20%
5,000 lb. or ft. to 9,999 lb. or ft. ....	30%
2,000 lb. or ft. to 4,999 lb. or ft. ....	45%
Under 2,000 lb. or ft. ....	65%

## CAST IRON WATER PIPE

### Per Net Ton

*6-in. and larger, del'd Chicago	\$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	56.00
F.o.b. dock, Seattle	66.00
4-in. f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	56.00

Class "A" and gas pipe, \$3 extra  
4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$46, Birmingham, and \$34 delivered Chicago and 4 in. pipe, \$49, Birmingham, and \$53 delivered Chicago.

## BOLTS, NUTS, RIVETS, SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

### Per Cent Off List

Machine and carriage bolts:	
1/2 in. & 6 in. and smaller	.65 and 5*
Larger and longer up to	
1 in. ....	.60 and 10*
1 1/2 in. and larger	.60 and 5*
Lag bolts	.60 and 10
Plow bolts, Nos. 1, 2, 3	
and 7	.65 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
1/2 in. and smaller	.65
9/16 in. to 1 in. inclusive	.60 and 5
1 1/2 in. and larger	.60

\* Less carload lots and less than full container quantity. Less carloads lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon units, U.S.S. and S.A.E.:

1/2 in. and smaller	.60 and 10
9/16 in. to 1 in. inclusive	.60 and 5
1 1/2 in. and larger	.60
Stove bolts in packages, nuts attached	.70
Stove bolts in packages, with nuts separate	.70 and 10
Stove bolts in bulk	.80

On stove bolts freight is allowed to destination on 200 lb. over.

### Large Rivets

(1/2-in. and larger)

### Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland	\$3.60
F.o.b. Chicago or Birmingham	3.70

### Small Rivets

(7/16-in. and smaller)

### Per Cent Off List

F.o.b. Pittsburgh	.65 and 5
F.o.b. Cleveland	.65 and 5
F.o.b. Chicago and Birmingham	.65 and 5

### Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more.)

### Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	.50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	.75
Milled headless set screws, cut thread 3/4 in. and smaller	.75
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	.70 and 5
Upset set screws, cup and oval points	.80 and 5
Milled studs	.65

## Alloy and Stainless Steel

### Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, \$60 a gross ton.

### Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton. Open-hearth grade, base..... 3.00c. Delivered, Detroit ..... 3.15c.

S.A.E. Series	Alloy Differential
Numbers	per 100 Lb.
200 (1/2% Nickel)	\$0.35
2100 (1 1/2% Nickel)	.075
2300 (3 1/4% Nickel)	1.55

2500 (5% nickel)	\$2.25
3100 Nickel-chromium	.070
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	.05s
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	.075
4600 Nickel-molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	.035
5100 Chrome steel (0.80-1.10 Cr.)	.045
5100 Chromium spring steel	.015
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	.085
Chromium-nickel-vanadium	1.50
Carbon-vanadium	.085

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

### Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

## CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

### Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

### Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

## TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

## British and Continental

### BRITISH

Per Gross Ton f.o.b. United Kingdom Ports

Ferromanganese, export	£20 Nominal
Tin plate, per base box	22s. 6d. to 23s.
Steel bars, open hearth	£11
Beams, open-hearth	£11 2s. 6d.
Channels, open-hearth	£11 7s. 6d.
Angles, open-hearth	£11 2s. 6d.
Black sheets, No. 24 gage	£14
Galvanized sheets, No. 24 gage	£16 15s.

## CONTINENTAL

Per Gross Ton, Gold £. f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate 1/2 in. and up	£6 17s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, 1/2 in.	£7 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 15s.



# IRON AND STEEL WAREHOUSE PRICES

## PITTSBURGH\*

	Base per Lb.
Plates	3.70c.
Structural shapes	3.70c.
Soft-steel bars and small shapes	3.80c.
Reinforcing steel bars	2.45c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot-rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs \$3.65
Per Cent Off List	
Track bolts, all sizes per 100 count	55
Machine bolts, 100 count	55
Carriage bolts, 100 count	55
Nuts, all styles, 100 count	55
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'd, base per 100 lb.	\$3.30
Wire, galv. soft, base per 100 lb.	\$3.70
Common wire nails, per keg	\$2.90
Cement coated nails, per keg	\$2.90

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

\* Delivered in Pittsburgh switching district.

\*\* Prices on application.

## CHICAGO

	Base per Lb.
Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	\$4.40
Track bolts (keg lots)	5.05
Rivets, structural (keg lots)	**4.95
Rivets, boiler (keg lots)	**5.05
Per Cent Off List	
Machine bolts and carriage bolts, 1/2 in. and smaller	60
Lag screws	*55 and 5
Hot-pressed nuts, sq. and hex., tap or blank, 1/2 by 6 in. and smaller	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$4.00 off list
Black ann'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Com. wire nails, 15 kegs or more, per keg	\$3.20
Cement c'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 479 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

\* These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

\*\* Base at 100 lb.

## NEW YORK

	Base per Lb.
Plates, 1/2 in. and heavier	4.02c.
Structural shapes	3.99c.
Soft steel bars, round	4.16c.
Iron bars, Swed. charcoal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.61c.
Flats and squares	4.61c.
Cold-rolled: strip, soft and quarter hard	3.96c.

Hoops	4.36c.
Bands	4.36c.
Hot-rolled sheets (No. 10)	4.00 to 4.11c.
Hot-rolled ann'd sheets (No. 24*)	4.50 to 4.75c.
Galvanized sheets (No. 24*)	5.25c.
Long term sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.50c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) for quantities 400 to 1499 lb.	
Standard quality	5.20c.
Deep drawing	5.85c.
Stretch leveled	5.85c.
SAE, 2300, hot-rolled	7.84c.
SAE, 3100, hot-rolled	6.39c.
SAE, 6100, hot-rolled, annealed	10.54c.
SAE, 2300, cold-rolled	9.04c.
SAE, 3100, cold-rolled, annealed	8.59c.
Floor plate, 1/2 in. and heavier	5.62c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Tire steel, 1 x 1/2 in. and larger	4.61c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	\$3.25

## Per Cent Off List

Machine bolts, square head and nut: All diameters. Prices on application  
Carriage bolts, cut thread: All diameters. Prices on application

\* For 1500 lb. or more; add 0.25c. on smaller lots. No. 28 and lighter, 36 in. wide, 20c. per 100 lb. higher.

## ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.34c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	5.29c.
Boiler rivets	5.39c.

## Per Cent Off List

Tank rivets, 7/16 in. and smaller 50  
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, nuts; all quantities 60

\* No. 26 and lighter take special prices.

## PHILADELPHIA

	Base per Lb.
*Plates, 1/2-in. and heavier	3.90c.
*Structural shapes	3.90c.
*Soft steel bars, small shapes, iron bars (except bands)	4.00c.
*Reinforc. steel bars, square and deformed	3.53c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.35c.
*Steel bands, No. 12 and 3/16 in. incl.	4.10c.
*Spring steel	5.50c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	4.00c.
*Diam. pat. floor plates, 1/2 in.	5.25c.

These prices are for delivery in Philadelphia trucking area.

\* Base prices subject to deduction on orders aggregating 4000 lb. or over.  
† For 25 bundles or over.  
‡ For less than 2000 lb.

## CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.86c.
Soft steel bars	3.75c.

†Reinforc. steel bars	2.50c.
‡Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
*Black ann'd wire, per 100 lb.	\$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95

## Per Cent Off List

Machine and carriage bolts, small 65 and 5  
Large 65 and 10  
Nuts, 100 count 1/2 in. and smaller 65 and 5  
3/16 in. to 1 in. 60 and 10

† Outside delivery 10c. less.

\* For 5000 lb. or less.

‡ Plus switching and carriage charges and quantity differentials up to 50c.

## CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.95c.
Floor plates	5.55c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Roll steel reinforc. bars	3.75
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	\$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	.55 per cent off list
No. 9 ann'd wire, per 100 lb. (1000 lb. or over)	\$3.48
Com. wire nails, base per keg: Any quantity less than carload	3.20
Cement c'd nails, base 100-lb. keg	3.50
Chain, lin. per 100 lb.	8.35

## Net per 100 Ft.

Seamless steel boiler tubes,	
2-in.	\$21.80
4-in.	52.45
Lap-welded steel boiler tubes,	
2-in.	20-73
4-in.	48.41

## BUFFALO

	Base per Lb.
Plates	3.95c.
Floor plates	5.55c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.00c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.82c.
Hot-rolled annealed sheets (No. 24)	4.83c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	4.00c.
Galv. sheet (No. 24)	5.38c.
Bands	4.25c.
Hoops	4.25c.
Heavy hot-rolled sheets	4.00c.
Com. wire nails, base per keg \$3.26	
Black wire, base per 100 lb. (2500-lb. lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

## BOSTON

	Base per Lb.
Channels, angles	4.26c.
Tees and zees, under 3 in.	4.51c.
H beams and shapes	4.10c.
Plates—Sheared, tank and univ. mill, 1/4 thick and heavier	4.11 to 4.61c.
Floor plates, diamond pattern	5.76c.
Bar and bar shapes (mild steel)	4.26c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.46 to 5.46c.
Half rounds, half ovals, ovals and bevels	5.51c.
Tire steel	5.51c.
Cold-rolled strip steel	3.86c.
Cold-finished rounds, squares and hexagons	4.71c.
Cold-finished flats	4.71c.
Blue annealed sheets, No. 10 ga.	4.21c.
One pass cold-rolled sheets No. 24 ga.	5.16c.
Galvanized steel sheets, No. 24 ga.	5.15c.
Lead coated sheets, No. 24 ga.	6.61c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.



## DETROIT

	Base per Lb.
Soft steel bars .....	3.94c.
Structural shapes .....	3.95c.
Plates .....	3.95c.
Floor plates .....	5.55c.
Hot-rolled annealed sheets	
(No. 24)* .....	4.69c.
Hot-rolled sheets (No. 10).....	3.94c.
Galvanized sheets (No. 24)**.....	5.40c.
Bands and hoops.....	4.19c.
Cold-finished bars .....	4.30c.
Cold-rolled strip .....	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series) .....	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

\*Under 400 lb., .50c. over base, 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

\*\*In Detroit only, 1500 to 3749 lb., base less 0.25c.; 3750 to 7499 lb., base less 0.40c.; 7500 lb. and over, base less 0.60c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

## MILWAUKEE

	Base per Lb.
Plates and structural shapes..	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles...	3.96c.
Soft steel bars, squares and hexagons .....	4.11c.
Hot-rolled strip .....	4.21c.
Hot-rolled annealed sheets (No. 24) .....	4.71c.
Galvanized sheets (No. 24)....	5.36c.
Cold-finished steel bars.....	4.41c.
Structural rivets (keg lots).....	5.16c.
Boiler rivets, cone head (keg lots) .....	5.26c.
Track spikes (keg lots).....	4.61c.
Track bolts (keg lots).....	5.81c.
Black annealed wire (No. 6 to No. 9 incl.) .....	3.85c.
Com. wire nails and cement coated nails	
100 to 4999 lb. ....	3.30c.

	Per Cent Off List
Machine bolts and carriage bolts, 1/2x6 and smaller or shorter....	65
Larger and longer up to 1 in., diam. ....	60-5
1 1/2 in. and larger.....	60
Coach and lag screws.....	60-5
Hot-pressed nuts, sq. and hex. tapped or blank, 1-199 lb.....	50
200 lb. and over:	
1/2 in. and smaller.....	62 1/2
9/16 to 1 in.....	60
1 1/2 in. and over.....	50-10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

## ST. PAUL

	Base per Lb.
Mild steel bars, rounds.....	4.10c.
Structural shapes .....	4.00c.
Plates .....	4.00c.
Cold-finished bars .....	4.77c.
Hot-rolled annealed sheets,	
No. 24 .....	4.75c.
Galvanized sheets, No. 24.....	5.25c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

## BIRMINGHAM

Bars and bar shapes .....	\$3.85 base	
Structural shapes and plates .....	3.75	"
Hot rolled sheets		
No. 10 ga. ....	3.80	"
Hot rolled sheets		
No. 24 ga. ....	4.40	" 3500 lb. and over
Galvanized sheets		
No. 24 ga. ....	5.05	" 3500 lb. or more
Strip .....	4.05	"
Reinforcing bars ..	3.85	"
Floor plates .....	5.96	"
Cold finished bars ..	4.91	"
Machine and carriage bolts .....	50 & 10 off list	
Rivets (structural) \$4.60 base		
On plates, shapes, bars, hot rolled strip, heavy hot rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.		

## BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	4.00c.
Structural shapes .....	3.90c.
Reinforcing bars, 5 to 15 tons.	3.16c.
Plates .....	3.90c.
Hot-rolled sheets, No. 10.....	3.95c.
Bands .....	4.20c.
Hoops .....	4.45c.
Special threading steel.....	4.15c.
Checkered floor plates 1/4 in. and heavier .....	5.50c.
Galvanized sheets, No. 24, 100 bds. or more.....	\$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more .....	\$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb. All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

## CHATTANOOGA

	Base per Lb.
Mild steel bars.....	4.21c.
Iron bars .....	4.21c.
Reinforcing bars .....	4.21c.
Reinforcing shapes .....	4.11c.
Plates .....	4.11c.
Hot-rolled sheets No. 10.....	4.16c.
Hot-rolled annealed sheets,	
No. 24* .....	4.06c.
Galvanized sheets No. 24*.....	4.66c.
Steel bands .....	4.41c.
Cold-finished bars .....	4.86c.

\* Plus mill item extra.

## MEMPHIS

	Base per Lb.
Mild steel bars .....	4.31c.
Shapes, bar size.....	4.31c.
Iron bars .....	4.31c.
Structural shapes .....	4.21c.
Plates .....	4.21c.
Hot-rolled sheets, No. 10.....	4.26c.
Hot-rolled annealed sheets,	
No. 24 .....	4.91c.
Galvanized sheets, No. 24.....	5.66c.
Steel bands .....	4.56c.
Cold-drawn rounds .....	4.80c.
Cold-drawn flats, squares,	
hexagons .....	6.30c.
Structural rivets .....	5.15c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list..	55

## NEW ORLEANS

	Base per Lb.
Mild steel bars.....	4.20c.
Reinforcing bars .....	3.24c.
Structural shapes .....	4.10c.
Plates .....	4.10c.
Hot-rolled sheets, No. 10.....	4.35c.
Steel bands .....	4.75c.
Cold-finished steel bars.....	5.10c.
Structural rivets .....	4.85c.
Boiler rivets .....	4.85c.
Common wire nails, base per keg .....	\$3.55
Bolts and nuts, per cent off list	60

## PACIFIC COAST

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M. ....	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars..	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock			
Pacific ports ..2.975c.	2.975c.	2.975c.	2.975c.
Hot-rolled annealed sheets (No. 24) .....	5.15c.	5.05c.	5.35c.
Hot-rolled sheets (No. 10) .....	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.25c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.45c.	5.90c.
Cold-finished steel			
Rounds .....	6.80c.	6.85c.	7.10c.
Squares and hexagons..	8.05c.	8.10c.	7.10c.
Flats .....	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	\$3.40	\$3.20	\$3.40

All items subject to differentials for quantity.

## REFRACTORIES PRICES

### Fire Clay Brick

	Per 1000 f.o.b. Works
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois .....	\$54.00
First quality, New Jersey.....	56.00
Select, Ohio .....	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois .....	49.00
Second quality, New Jersey....	51.00
No. 1, Ohio .....	46.00
Ground fire clay, per ton.....	8.00

5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.

### Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania .....	\$54.00
Chicago District .....	63.00
Birmingham .....	54.00
Silica cement per net ton (Eastern) .....	9.50

5 per cent trade discount on silica brick.

### Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester...	\$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. ....	49.00

### Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester .....	\$69.00
Chemically bonded, f.o.b. Baltimore .....	59.00

### Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks) ..	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks .....	43.00
Domestic, f.o.b. Chewelah, Wash	25.00

## RAW MATERIALS PRICES

### PIG IRON

#### No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.47
Delivered Newark or Jersey City	26.53
Delivered Philadelphia	25.84
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.44
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.50
Delivered, San Francisco, Los Angeles or Seattle	27.45
F.o.b. Birmingham*	20.38

\* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

#### Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

#### Basic

F.o.b. Everett, Mass.	\$25.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.61
Delivered Canton, Ohio	24.89
Delivered Mansfield, Ohio	25.44
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

#### Bessemer

F.o.b. Everett, Mass.	26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.53
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago.	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.61
Delivered Canton, Ohio	25.89
Delivered Mansfield, Ohio	26.44

#### Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$28.50
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#### Gray Forge

Valley or Pittsburgh furnace	\$23.50
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#### Charcoal

Lake Superior furnace	\$27.00
Delivered Chicago	30.34

#### Canadian Pig Iron

##### Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

##### Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

### FERROALLOYS

#### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Per Gross Ton	
Domestic, 80% (carload)	\$102.50

#### Spiegeleisen

Per Gross Ton Furnace	
Domestic 19 to 21%	\$33.00
F.o.b. New Orleans	33.00

#### Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size	
50% (carload lots, bulk)	\$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

#### Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio	
Per Gross Ton	
10.00 to 10.50%	\$33.50
For each additional 0.50% silicon up to 17%, 50c. per ton is added.	
Manganese 2 to 3%, \$1 per ton additional.	
For each unit of manganese over 3%, \$1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.	
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	

#### Silvery Iron

Per Gross Ton	
F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$27.50
For each additional 0.5% silicon up to 17%, 50c. a ton is added.	
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	
Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.	

#### Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract	
4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

#### Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract	
3% carbon	\$101.50*
2.50% carbon	106.50*
2% carbon	111.50*
1% carbon	121.50*

#### Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally	\$2.60
Ferrotungsten, lots of 500 lbs., nominally	2.05
Ferrotungsten, smaller lots, nominally	2.10
Ferrovanadium, contract, per lb. contained V., delivered	\$2.70 to \$2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	\$2.25†
Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$142.50
Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	\$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	\$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville.	\$75.00
Ferromolybdenum, per lb. Mo, f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo, f.o.b. furnace	80c.

\*Spot prices are \$5 per ton higher.  
†Spot prices are 10c. per lb. of contained element higher.

### ORES

#### Lake Superior Ores

Delivered Lower Lake Ports	
Per Gross Ton	
Old range, Bessemer, 51.50%	\$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

#### Foreign Ore

C.A.F. Philadelphia or Baltimore	
Per Unit	
Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68 1/2% iron Nominally	17 to 18c.
Iron, basic or foundry, Swedish, aver. 65% iron Nominally	15c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed	52% .....
Man., African, Indian, 44-48%	45c.
Man., African, Indian, 49-51%	40c.
Man., Brazilian, 46 to 48 1/2%	Nominal
Per Short Ton Unit	
Tungsten, Chinese, Wolframite, duty paid, delivered	\$24.00
Tungsten, domestic, scheelite delivered	\$22.00 to \$25.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton:	
South African (low grade)	\$16.00
Rhodesian, 45%	22.00
Rhodesian, 48%	25.50
Turkish, 43-49%	25.00 to \$26.00
Turkish, 45-46%	23.50 to 24.00
Turkish, 44%	19.00 to 19.50
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:	
50%	\$25.50 to \$26.50
48-49%	25.50 to 26.00

### FLUORSPAR

Per Net Ton	
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$18.00 to \$19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines	31.50

### FUEL OIL

Per Gal.	
F.o.b. Bayonne or Baltimore, No. 3 distillate	4.75c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	4.75c.
Del'd Ch'go, No. 3 industrial	4.15c.
Del'd Ch'go, No. 5 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.75c.
Del'd Cleve'd, No. 4 industrial	5.625c.
Del'd Cleve'd, No. 5 industrial	3.50c.

### COKE

Per Net Ton	
Furnace, f.o.b. Connellsville, Prompt	\$4.00 to \$4.25
Furnace, f.o.b. Connellsville, Prompt	5.00 to 6.25
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	11.05
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis Industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75



# New Development in Cutters, Tools and Gages

(CONTINUED FROM PAGE 49)

A new *Leitz* profile projector, suitable for the average tool and instrument shop, has been placed on the market by *George Scherr Co.*, 128 Lafayette Street, New York. The instrument is intended for inspecting small mechanical parts, gears, gages, templates, watch parts, taps and screws. The parts to be inspected are placed on top of a compound table having micrometer adjustment 1 x 1 in. in both directions. The contour of the part is magnified 10 to 100

source is a low-voltage incandescent lamp.

## Master Planer Gage

The "Master" planer and shaper gage, No. 900, is being offered by the *Lufkin Rule Co.*, Saginaw, Mich. An important feature is that the slot in which the slide travels is beveled and ground, the bevel preventing side play when the slide is tightened. The gage can be used on base, end or flat on either side, since both slide and nut are within the outside of the base.



OF interest to jobbers is the display board exemplifying A. Milne & Co.'s new color bar code system for identifying tool steels. An overall coating of various lacquer colors is used, instead of marking merely the bar end (Iron Age, p. 95, Dec. 9, 1937).

times and projected on a drawing board in front of the instrument. The operator compares the outlines with a scale drawing or one traced from a master part. Deviations from the standard can be accurately measured by means of the two micrometer screws attached to the cross table, or by gage blocks.

## Inspection Simplified

Small parts are placed directly on the glass top, eliminating the necessity of holding fixtures or vises. For cylindrical work, such as taps, the pieces are placed between centers and can then be checked, not only for form, lead and angle, but also for concentricity. The table can be swiveled so that a sharp image is obtained on both flanks of screw threads up to 12-deg. helix angle. The light

Base and slide are of drop forged steel, hardened. The gage is  $\frac{5}{8}$  in. wide and  $5\frac{1}{8}$  in. long.

Used as a planer gage, by setting it to a micrometer, surface gage or caliper, it facilitates adjusting the tools. With the extension, tool settings from  $\frac{1}{4}$  to 9 in. can be made; without the extension,  $6\frac{1}{2}$  in. The gage can also be used as an adjustable parallel, or with a sine bar for grinding angles; also with gage blocks for building up work on a surface plate and for transferring measurements.

## Beam Compass

A quickly adjustable beam compass has been put on the market by *A. P. Bartusch*, 775 Walnut Street, Lockport, N. Y. It uses either pen or pencil. To adjust it, the pin holder at the left is tightened and the pencil holder

is propelled along the beam by turning the knurled roller. The smallest radius that can be set is  $1\frac{5}{16}$  in. and the maximum is 2 in. short of the beam length. Standard beam is 12 in., but 24 and 36-in. beams are obtainable. Metal parts are nickel silver.

## Fan Type Indicator

Complete flexibility of design is featured in the "Universal Junior" No. 564 indicator just introduced by the *L. S. Starrett Co.*, Athol, Mass. The ball contact is frictionally held at any angle. Also, the sleeve that holds the contact point can be turned completely around, as can the entire indicator on its shank. The indicator can be mounted on the side or on the top of the shank when used in the tool post of a lathe, or the indicator can be attached to the jaw of a height gage. Readings are made in thousandths over a range of 0.012 in. on the fan gage. All parts are case-hardened steel or die cast. Shank is  $\frac{1}{4} \times \frac{1}{2} \times 5$  in.

## Wire Association Meeting Draws 300

PITTSBURGH.—More than 300 members and guests of the Wire Association last week attended a Pittsburgh regional meeting which included an inspection trip of the plant, specifically the wire mills, of the Pittsburgh Steel Co., Monessen, Pa. Arrangements were made by J. K. Beeson, Pittsburgh Steel.

Before the technical session in the evening, F. A. Westphal, president of the Wire Association and superintendent of wire mills, Sheffield Steel Co., Kansas, Mo., welcomed members and guests.

S. A. Braley, Mellon Institute of Industrial Research, Pittsburgh, presented a paper on "Wire Mill Practices." A comprehensive review of various production practices at mills throughout the country with emphasis on galvanizing, wire drawing, finishes, etc., was presented.

B. L. McCarthy, chief metallurgist, Wickwire Spencer Steel Co., Buffalo, discussed "Factors that Influence Uses of Metals." Indicating that the constituent basic forms of metals may be changed by heat treating and also by addition of alloying metals, Mr. McCarthy reviewed and discussed various specifications for wire products with emphasis on the proper treatment.

John E. Timberlake, Jones & Laughlin Steel Corp., Pittsburgh, was chairman of the evening session.



# THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

*... Buyers everywhere show hesitation in following up recent inquiries with orders.*

o o o

*... Even automobile makers are holding back orders for equipment needed for the large 1939 programs.*

o o o

*... Resumption of foreign demand is building up backlogs at machinery centers.*

## Much Equipment Inquired for Yet to Be Bought

**D**ETROIT—Comparatively little machine tool buying has come out of the activity reported in recent weeks. Quotations have not been acted on, most of the buying activity being in the smaller items and in perishable tools. Contrary to the trend of a few weeks ago, die programs are lagging, with no new work reported for about two weeks. Check up among major suppliers in this vicinity indicates that the delivery situation is about normal, with approximately 10 weeks being the average outside figure. One of the leaders expressed the opinion that even if the auto plants hold back in purchases for some time yet, delivery in time for production of next fall's models could be attained. It is generally conceded, however, that the deadline is virtually at hand and that if action is not forthcoming, there will be difficulty in getting production-built cars in time for the Auto Show, in view of the fact that all the companies have major programs which might break at the same time.

## Northern Ohio Plants Hesitate in Buying

**C**LEVELAND—Domestic orders remain scattered and lack any pronounced uptrend. A number of northern Ohio plants are still studying over the possibilities of purchasing pieces of equipment, principally lathes and planers, but are in no hurry to place orders until general business conditions become better. Westinghouse Electric & Mfg. Co. is understood to be inquiring for a drilling machine and a cut-off machine for its Cleveland works, and a cut-off saw and 30-in. high speed band saw for Lima.

Ford has purchased from this district two single-purpose machines for the production line and recently ordered a few additional presses for the new body shop. In general, however, the large Ford program of expansion appears to have been disrupted. Other automobile manufacturers likewise have slowed down on expansion, although die shops are still busy on plans for the 1939 models. It is believed that the Ford company's contemplated replacement of a number of old lathes will not suffer. Scattered orders

have been received from General Motors, principally for the forging department.

## Cincinnati Reports Pickup in Foreign Demand

**C**INCINNATI—Renewal of foreign interest in machinery stimulated bookings the past week to a higher level than during the preceding period. Business is reported from both European and Far Eastern sources, but size is undisclosed. So far as types are concerned, there is no change from the regular rotation of millers, lathes and grinders. Drilling tools are without apparent consumer interest, while heavy tools reflect an ordinary demand. Planers and boring mills are attracting regular business, but this is without vigor. Domestic ordering is still moderate, but without evidence of aggressive consumer interest.

Inquiry is steadily active for all types of machines. Recipients of quotations, however, are not disposed to close and are apparently keeping an eye on general conditions before making commitments. Plant operations are about 40 per cent of capacity. One or two plants are running on stock machines to keep factory forces intact against early anticipated demand.

## Buyers Still Marking Time in Metropolitan Area

**N**EW YORK—New orders for machine tools were at an extremely low level at month's end, and April will probably show no change for the first week or two. This statement should not be taken to mean that there is no business in sight, however. There is still an unreaped harvest from quotations that were made at a very high level in January and February. As far as the buyers are concerned, decision has frequently gone to the point where the specific equipment and tooling have been selected, and the only step needed to initiate the purchase is the all-important signature. Yet, even companies that have the necessary funds are withholding action at this time, showing an apparent lack of confidence in the future. When that confidence returns, it will be en masse, and many sellers foresee a grand rush for equipment, with deliveries quickly climbing back to the point they were at a year or more ago.

Army and Navy buying thus far has

been substantial, but an even greater volume of orders is expected to be released from the arsenals and the Navy yards when the new and enlarged appropriations are approved by Congress.

## Better Feeling in Mid-West Based on Inquiry Volume

**C**HICAGO—A large number of miscellaneous inquiries are being reported from various sales offices here, and a feeling of optimism is slowly becoming apparent. March sales generally were far from outstanding, only minor gains being evident, if at all, but machinery sellers feel that many of the inquiries now being made would not be out unless a good volume of business were in the making at the many plants that are expressing interest in new equipment. Individual outstanding inquiries are negligible, lots of one and two machines constituting most of the total. Considerable activity on the Milwaukee road's list of 20-odd items has been reported, and the award of most of this equipment is expected at any time.

## Designing Engineers Vote To Affiliate with CIO

**W**ASHINGTON.—The Society of Designing Engineers, an independent organization of 2000 automobile engineers, has voted to join the CIO's Federation of Architects, Engineers and Technicians, CIO headquarters in Washington has announced. The group will be known as the Automobile Division of the FAET. It was said that 58 per cent of the members of the Union voted for CIO affiliation.

## John Howe Hall to Discuss Steel Castings

**S**TEEL castings, their production and design will be the subject of a talk to be given by John Howe Hall, consulting metallurgist and Howe Memorial lecturer in 1929, at the monthly meeting of the Metropolitan chapter of the American Foundrymen's Association. The meeting will be held at the Essex House, Newark, on April 18. Technical chairman for the meeting will be H. J. French, International Nickel Co.

## Universal Cyclops Program Under Way

**W**ALTER H. BAKER, president, Universal Cyclops Steel Corp., Bridgeville, Pa., stated in the annual report that improvements at the Bridgeville plant are expected to be completed about the middle of the year. The balance sheet for the end of 1937 shows cash of \$1,194,348, assets of \$2,830,195 and liabilities of \$625,124.

# PLANT EXPANSION AND EQUIPMENT BUYING

## ◀ NORTH ATLANTIC ▶

**Reynolds Metals Co., Inc.**, 19 Rector Street, New York, metal specialties, tin, aluminum and other metal foils, etc., has plans for one-story branch plant at 127 West Sixth Street, Richmond, Va. Cost close to \$40,000 with equipment.

**Dierks Heating Co.**, 210 East Thirty-first Street, New York, manufacturer of heating and ventilating equipment, has leased a two-story building at 43-32 and 43-38 Thirty-third Street, Long Island City, and will improve for new branch plant.

**Poloron Products, Inc.**, Bradford Road, Mount Vernon, N. Y., manufacturer of electrical appliances and allied specialties, plans rebuilding part of two-story plant recently destroyed by fire. Loss over \$100,000 with equipment.

**American Brake Shoe & Foundry Co.**, 230 Park Avenue, New York, has asked bids on general contract for extensions and alterations in machine shop at branch plant at 2001 Laurens Street, Baltimore. Cost close to \$40,000 with equipment.

**Socony-Vacuum Oil Co.**, 26 Broadway, New York, has asked bids on general contract for two-story and basement addition to branch technical plant at Paulsboro, N. J., 46 x 120 ft., including improvements in present building. Cost close to \$100,000 with equipment. Frederick G. Frost, 144 East Thirtieth Street, New York, is architect.

**Maytag Washer and Ironer Co.**, 667 Washington Street, New York, operated by Maytag Co., Clinton, Iowa, manufacturer of electric-operated washing and ironing machines, has leased a four-story and basement building at 34-18 to 34-28 Northern Boulevard, Long Island City, for new factory branch, storage and distributing plant. It will be operated by Maytag-Atlantic Co., Eastern division of company.

**Delaware, Lackawanna & Western Railroad Co.**, 140 Cedar Street, New York, C. C. Hubbell, general purchasing agent, asks bids until April 11 for miscellaneous machinery for new steel transfer bridge at Twelfth Street, Hoboken, N. J.

**Aga Stove Co.**, 500 Fifth Avenue, New York, has leased space in Mooney Building, Cranford, N. J., for plant.

**Make-A-Lite, Inc.**, New York, organized to manufacture small generator units and accessories, has leased a floor in building at 105 East Twenty-ninth Street, for plant.

**Salem Brothers**, 329 Fifth Avenue, New York, manufacturer of lighting fixtures, lamps, etc., with plant at 122 Centre Street, recently taken over by City of New York, have purchased a one-story building on East Elizabeth Avenue, Linden, N. J., for new plant.

**Commanding Officer**, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until April 13 for five chrome nickel steel tanks (Circular 819); until April 18 for 275 containers, formed steel die work, as per U. S. Army specifications 96-71-28 (Circular 820).

**Uco Food Corp.**, 506 Frelinghuysen Avenue, Newark, N. J., food products, has purchased former local plant of Carrier Engineering Co., 850 Frelinghuysen Avenue, consisting of a four-story building, occupying a block front. It will be improved for new plant for packing, storage and distribution of food specialties.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until April 12 for two ½-ton and one 6½-ton wire rope electric whip hoists, and 3½-ton trolleys, with

spare parts (Schedule 3016), four stress-relieving furnaces (Schedule 3198) for Philadelphia Navy Yard; five gasoline marine engines and spare parts (Schedule 3190) for Philadelphia and Norfolk, Va., yards; until April 15, 13 motor-operated mechanisms for opening and closing vent covers, 13 reversing controllers and 13 remote controls and spare parts (Schedule 3211) for Philadelphia yard.

**Commanding Officer**, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until April 11 for two electric hoists (Circular 855), one vertical spindle sander (Circular 854), 150 radial ball bearings (Circular 853); until April 12, 140 gages, plain, plug, twin ring, taper ring, snap, etc. (Circular 829), one 2½-in. bar turret lathe (Circular 860).

## ◀ BUFFALO DISTRICT ▶

**New York State Electric & Gas Corp.**, Ithaca, N. Y., plans extensions in electric power lines in 33 counties in northern part of State, totaling about 245 miles, with operating and service facilities. Fund of \$250,000 has been arranged through Federal aid.

**S. M. Flickinger Co.**, 180 Niagara Frontier Food Terminal, Buffalo, wholesale food products, has asked bids on general contract for new multi-story branch storage and distributing plant at Elmira, N. Y., 170 x 268 ft. Cost over \$100,000 with equipment. H. E. Plummer & Associates, 775 Main Street, Buffalo, are architects and engineers.

## ◀ NEW ENGLAND ▶

**Salem Coca-Cola Bottling Co.**, Salem, N. H., has asked bids on general contract for two-story addition to mechanical bottling plant, 60 x 100 ft. Cost about \$45,000 with equipment. J. E. Allen, 351 Essex Street, Lawrence, Mass., is architect.

**Nashua River Paper Co.**, East Pepperell, Mass., manufacturer of kraft and sulphate paper specialties, plans rebuilding part of mill used for storage and distribution, recently destroyed by fire. Loss over \$250,000 with equipment.

**Connecticut Light & Power Co.**, Pearl Street, Hartford, Conn., has let general contract to United Engineers & Constructors, Inc., 1401 Arch Street, Philadelphia, for new steel gas storage holder at Waterbury, Conn., 145 ft. in dia. and 178 ft. high. Cost about \$175,000.

**Commanding Officer**, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until April 12 for 100 high-speed steel taps (Circular 192); until April 21, one vertical retort, gas carburizing, gas-fired furnace (Circular 191).

## ◀ SOUTH CENTRAL ▶

**Ashland Oil & Refining Co.**, Ashland, Ky., will ask bids early in May for extensions and improvements in oil refinery at Leach Station, Ky., with equipment to increase handling capacity of plant to about 6000-bbl. per day. A new oil-skimming unit will be installed. Cost about \$175,000. This is part of a \$750,000 expansion and improvement program to be carried out by company at different plants.

**United States Engineer Office**, First District, New Orleans, asks bids until April 15 for three floating conveyors (Circular 246).

**J. Aron & Co.**, 416 Poydras Street, New Orleans, plan rebuilding cane sugar refinery near Labadie, La., operated in name of

Supreme Sugar Refinery, recently destroyed by fire. Loss over \$500,000 with machinery.

**United States Engineer Office**, Louisville, asks bids until April 11 for three two-drum, gasoline engine-driven hoists (Circular 363).

**City Council**, Plaquemine, La., asks bids until April 12 for extensions and improvements in municipal electric power plant, including new 450-kw. diesel engine-generator unit and accessory equipment, deep-well turbine pumping unit, service pump, switchboard, crane and miscellaneous equipment.

**Four-Son Coal Corp.**, Diablock, Perry County, Ky., plans rebuilding tipple at local coal-mining properties, recently destroyed by fire. Loss over \$50,000 with equipment.

## ◀ SOUTH ATLANTIC ▶

**Protect-U-Awning Shutter Co.**, 233 N.W. Twenty-second Street, Miami, Fla., manufacturer of metal awning shutters and frames, has asked bids on general contract for new one and two-story plant, 81 x 275 ft. Cost over \$65,000 with equipment. H. P. Hardin, 358 N.W. Twenty-ninth Street, is engineer.

**Coca-Cola Bottling Co.**, Rome, Ga., will take bids soon on general contract for one and two-story mechanical-bottling plant at Cartersville, Ga. Cost about \$50,000 with equipment. O. C. Poundstone, Palmer Building, Atlanta, Ga., is architect.

## ◀ WESTERN PA. DIST. ▶

**Appalachian Electric Power Co.**, Roanoke, Va., has let general contract to Bacon-Coombs Co., Morgantown, W. Va., for one-story service, repair and operating building at Beckley, W. Va., with department for meter repairs and other precision work, equipment storage and distributing division, and service and garage unit for company motor trucks and cars. Cost about \$135,000 with equipment.

**Eagle Collieries, Inc.**, Charleston, W. Va., plans coal tipple and conveyor installation on Kanawha River, near Deepwater, W. Va., where company mining properties are located. Cost over \$50,000.

## ◀ SOUTHWEST ▶

**City Council**, Kennett, Mo., asks bids until April 12 for municipal electric power plant, including two 400-kw. diesel engine-generator units and auxiliary equipment (Contract No. 1), power station building, 37 x 55 ft., with wing extension, 11 x 26 ft. (Contract No. 2), and electrical distribution system, totaling about 351,600 ft. of wire and cable, with line hardware and fittings, etc. (Contract No. 3). Cost about \$170,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

**Myers Milling Co.**, Harrison, Ark., plans two new grain elevators at rear of milling plant, capacity about 70,000 bu. Cost over \$55,000 with conveying, elevating, screening and other equipment.

**Grand River Dam Authority of Oklahoma**, City Hall, Vinita, Okla., asks bids until April 19 for 14-mile power transmission line to main dam on Grand River, near Pensacola, Okla., for power supply for construction service. Bids will be asked soon, closing early in June, for main power dam, power house, spillway, gates, gate hoists, hydraulic turbines, electric generators, traveling crane and other power station equipment. Entire project will cost \$20,000,000. Financing has been arranged through Federal aid. Holway & Neuffer, 302 East Eighteenth Street, Tulsa, Okla., are consulting engineers.

**Tulsa Cotton Oil Co.**, 419 North Quincy Street, Tulsa, Okla., cottonseed oil products, plans one-story addition, 60 x 280 ft., for storage and distribution, to replace unit recently destroyed by fire. Cost close to \$50,000 with equipment.

**Tennison Brothers**, Houston, Tex., manufacturer of sheet metal products, with main plant at Texarkana, Ark., has acquired about 55 acres in East End district, Houston, for



new plant, for which plans will be drawn soon. Cost over \$400,000 with equipment.

**Coca-Cola Co.**, Atlanta, Ga., has let general contract to Inge Construction Co., Republic Bank Building, Dallas, Tex., for new plant at Lemmon Street and Mockingbird Lane, Dallas, where about 23 acres was acquired recently. Main unit will be two and three-stories, 200 x 600 ft., with several smaller buildings. A mechanical-bottling department will be installed. Cost close to \$1,000,000 with machinery.

**Barry Wehmiller Machinery Co.**, 4660 West Florissant Avenue, St. Louis, manufacturer of bottling machinery, is building a one-story addition to its machine shop, at an expenditure of \$20,000, which will provide 5742 additional sq. ft. of floor space.

## ◀ WASHINGTON DIST. ▶

**Purchasing and Contracting Officer**, Holabird Quartermaster Depot, Baltimore, asks bids until April 19 for automobile parts (Circular 398-123).

**Chief of Ordnance**, Ordnance Department, Washington, is investigating manufacture of demolition bomb bodies by metallic arc welding with use of low alloy steels. Workmanship must be equal to or superior to that used in pressure vessel construction. Proposals will be issued soon after July 1. Complete information is available at office noted.

**Quartermaster**, Fort Myer, Va., asks bids until April 26 for two steam heating boilers (Circular 579-13).

**Krause Bottling Co.**, 2250 Reisterstown Road, Baltimore, has let general contract to Abbott Construction Co., 523 West Saratoga Street, for two-story mechanical-bottling plant at 415-17 North Paca Street, with facilities for storage and distribution. Cost close to \$50,000 with equipment. Samuel Smulian, 3712 Belle Avenue, is architect.

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids until April 11 for one steel tower for air control service at Naval Station, Anacostia, Wash. (Specifications 8680).

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until April 12 for pressure gages (Schedule 3159), flanged steel valves (Schedule 3163); until April 15, copper-nickel alloy condenser tubes (Schedule 3175) for Eastern Navy yards and Puget Sound yard; for quantity of winches (Schedule 3064), motor-driven universal milling machines, spare parts, tools and equipment (Schedule 3212); until April 19, iron pipe fittings (Schedule 3154) for Eastern and Western yards; until April 15, seamless steel tubing (Schedule 3196) for Sewell's Point Navy Yard.

## ◀ MICHIGAN DISTRICT ▶

**Fisher Body Division**, General Motors Corp., General Motors Building, Detroit, has let general contract to Darin & Armstrong, Inc., 2041 Fenkel Street, for extensions and improvements in plant on Piquette Avenue. Cost over \$50,000 with equipment.

**City Council**, Menominee, Mich., has authorized purchase of site for new municipal electric power plant, and will ask bids soon on project. Cost about \$890,000, to be provided through bond issue and Federal grant. Francis Engineering Co., Saginaw, Mich., is consulting engineer.

## ◀ OHIO AND INDIANA ▶

**Ohio River Refining & Terminal Co.**, 4201 Liston Avenue, Cincinnati, has awarded general contract to Hodges Construction Co., 1031 Flint Street, for two-story addition to oil products plant, 60 x 100 ft. Cost over \$65,000 with equipment. Frank Hall, Carew Tower Building, is engineer.

**Libbey Glass Co.**, Ash Street and Wheeling & Lake Erie Railroad, Toledo, manufacturer of tumblers and containers, etc., has plans for one-story addition. Cost about \$500,000 with machinery. Work is scheduled to begin early this spring.

**Antonio Palazzolo & Co.**, 712 Central Avenue, Cincinnati, manufacturers of food products, will take bids at once on general contract for new six-story and basement plant, 100 x 100 ft., at 2009 Gilbert Avenue. Part of building will be used for bulk storage and distributing, with another section for processing, packing, etc. Cost about \$125,000 with equipment. Carlton, Frankenberger & Batson, 4122 Davis Lane, are architects; O. W. Motz, 920 East McMillan Street, is mechanical engineer.

**Contracting Officer**, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until April 11 for hand-operated box and pan brake, hand-operated ring and circular shear, two sheet metal brakes, two squaring shears, two slip roll formers, one punch-type nibbler, one sheet metal machine, one rotary shear, one band saw, two motor-driven nibblers, two metal-cutting saws, nine motor-driven drill presses, two turret punches, and one motor-driven circular saw (Circular 820); until April 12, one water spray cooling tower, fan-driven draft type, with accessories (Circular 826), suspension cable fittings, envelope bow fittings, basket suspension cable assemblies, attachment assemblies, terminal clamping rings, pulley assemblies, etc. (Circular 827); until April 14, thermometer testers (Circular 816).

**Board of School Trustees**, Seventh and Vine Streets, Evansville, Ind., Rufus B. Putman, business director, will take bids soon on general contract for one-story and basement vocational school at Wedeking Avenue and Stringtown Road, 188 x 250 ft., with boiler house adjoining. Cost about \$250,000 with equipment. Fowler & Legeman, Central Union Bank Building, are architects.

## ◀ MIDDLE WEST ▶

**Pullman-Standard Car Mfg. Co.**, 79 East Adams Street, Chicago, has approved plans for one-story machine shop, 50 x 250 ft., at car works, Michigan City, Ind. Cost over \$100,000 with equipment.

**Match King, Inc.**, 230 North Jefferson Street, Chicago, manufacturer of safety and electric razors, etc., has leased about 13,000 sq. ft. of floor space in D. & K. Building, 711 West Lake Street, for expansion.

**Quartermaster Depot**, 1819 West Pershing Road, Chicago, asks bids until April 22 for steel clothes lockers for various deliveries (Circular 199-166).

**City Council**, New Hampton, Iowa, has engaged R. W. Gearhart, 349 Twenty-first Street, S.E., Cedar Rapids, Iowa, consulting engineer, to prepare plans for extensions and improvements in municipal electric power plant, including new diesel engine-generating units, and auxiliary equipment. Cost about \$100,000.

**Key City Gas Co.**, 669 Main Street, Dubuque, Iowa, plans extensions and improvements in coal-gas generating plant, including additional equipment. Cost about \$75,000 with machinery.

**Superintendent of Construction**, Indian Service, Billings, Mont., asks bids until April 11 for one 2000-gal. water storage tank for Fort Yates, N. D.

**York County Farmers' Union Oil Co.**, York, Neb., Earl Jenkins, manager, has authorized plans for new plant for production of alcohol for use as motor fuel. It will include steel tank storage and distributing division, pumping station and other mechanical departments. Cost over \$85,000.

**Bureau of Reclamation**, Denver, asks bids until April 18 for two 102-in. steel bulkheads for power penstocks at Seminole power plant, Kendrick project, Wyo. (Specifications 1055-D).

## ◀ PACIFIC COAST ▶

**Monarch Brewing Co.**, 1850 North Main Street, Los Angeles, has let general contract to Walter Trepte, 631 Ninth Avenue, San Diego, Cal., for one-story mechanical-bottling works, 73 x 150 ft. Cost over \$60,000 with equipment. Hugo Eckart, 1015 East Eighth Street, and Wayne D. McAllister, 1709 West

Eighth Street, both Los Angeles, are engineer and architect, respectively.

**Constructing Quartermaster**, Sacramento Air Depot, Sacramento, Cal., asks bids until May 24 for a technical airplane engine test building, including pumps, oil heaters, filters and accessories, hydraulic lifts, elevators, mechanical equipment with engine mounts, etc. (Circular 6870-20).

**United Dressed Meats, Inc.**, 116 North Havana Street, Spokane, Wash., will take bids at once on general contract for new two-story meat-processing and packing plant on Trent Avenue. Cost about \$50,000 with equipment. Arthur Bartron, 511 West Comstock Street, Seattle, is engineer.

**Department of Interior**, Federal Office Building, Seattle, asks bids until April 12 for generating units, exciters, switchboard and auxiliary equipment for power plant at hotel group at Mount McKinley National Park, Alaska.

**George R. Borrmann Steel Co.**, Eighth and Fallon Streets, Oakland, has plans for one-story addition. Cost over \$40,000 with equipment. Will G. Corlett, Bank of America Building, is architect.

**Board of Education**, 1425 San Pedro Street, Los Angeles, plans one-story vocational shop at Hollywood high school, 1521 North Highland Avenue, for which bids have been asked on general contract. Cost over \$50,000 with equipment. Marsh, Smith & Powell, 816 West Fifth Street, are architects.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until April 15 for 27-in. magnesium alloy streamline wheels for airplanes, with brakes (Schedule 900-1643); until April 22, parts for airplanes (Schedule 900-1641) for San Diego, Cal., Naval Air Station.

**Board of Public Works**, City Lighting Department, City Light Building, Seattle, will take bids soon for new municipal high-tension transmission line No. 2, extending from Newhalem, Whatcom County, to South station, Seattle, totaling about 700 miles of aluminum steel-reinforced cable and 1.7 miles of copper-welded ground wire, for power supply from Skagit River municipal hydroelectric power development.

## ◀ FOREIGN ▶

**Commonwealth Oxygen & Acetylene, Ltd.**, Balmain, Sydney, New South Wales, Australia, manufacturer of industrial gases, has approved plans for new one-story plant at Alexandria, New South Wales. Cost over \$100,000 with equipment. Robertson, Marks & McCredie, Sydney, are architects.

**Bowaters & Lloyds Newfoundland, Ltd.**, St. Johns, Newfoundland, manufacturer of pulp and paper products, a subsidiary of Bowaters, Ltd., London, England, has arranged with Reid Newfoundland Co., Ltd., St. Johns, for purchase of a large tract of timber property on East coast of Newfoundland. Part of land will be used for new sulphite pulp mill, for which plans will be drawn under direction of parent company, to include power house, pumping station, machine shop and other mechanical divisions. Cost estimated at \$10,000,000. Eric V. Bowater is president.

**Otis Steel Co.**, Cleveland, reports 1937 net earnings of \$2,320,031 after deductions for depreciation, normal income tax and surtax on undistributed profits, compared with 1936 net earnings of \$1,980,149. Company's statement showed current assets of \$12,121,457 as against current liabilities of \$2,188,085 and a surplus balance of \$6,608,346. Federal taxes for the year were \$520,000. All of the outstanding 7 per cent prior preferred stock has been surrendered. E. J. Kulas, president, told stockholders that during 1937 capital expenditures for the company amounted to \$1,579,849, while \$2,615,608 was spent for repairs, maintenance and renewals charged to operations.

**Standard Steel Spring Co.**, Pittsburgh, reports net income for the year 1937 of \$362,685, equal to \$1.80 a share, compared with \$156,035 in 1936.